SITE: Athens Furniture
BREAK: 1.9
OTHER: V2

# SITE INSPECTION (SI) SAMPLE PLAN

Site Name: **Athens Furniture, Inc.**

Location: **Athens, McMinn County, Tennessee**

EPA ID #: **NA**

TDoR File #: **54-519**

## 1.0 INTRODUCTION

The Tennessee Division of Remediation (TDoR) has been tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct a Site Inspection (SI) for the above Site. This investigation will be conducted pursuant to the authority and requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Public Law 196-510; Section 104; and the Superfund Amendments and Reauthorization Act (SARA), Public Law 99-499.

## 1.1 OBJECTIVES

The objectives of this sampling investigation are to collect information to assist in developing a Site-specific Preliminary HRS score and to determine if further investigation is required at the Site.

Specific elements are:

-Characterize the nature of contamination at the Site.
-Obtain information to calculate a Preliminary HRS score.
-Provide EPA the necessary information to make decisions on any other actions warranted at the Site.

## 1.2 SCOPE OF WORK

The scope of this investigation will include the following activities:

-Obtain and review background materials relevant to HRS scoring of the Site.
-Develop a detailed Site sketch, showing sampling locations, Site topography and other relevant Site data.

-Investigate the Site with regard to ground water use, surface water use, airborne exposure, and possibility of direct contact and/or fire and explosion hazards.
-Collect environmental samples from surface media such as soil and sediment.

## 1.3 SCHEDULE

| | | |
|---|---|---|
| Begin Site Investigation | -- | Upon approval of Study Plan |
| Data Collection | -- | One week (six weeks for analysis) |
| Report Writing | -- | Three weeks |
| Draft Report Review | -- | One week |
| Report Revision/Submission to USEPA | -- | One week |

## 1.4 PERSONNEL

| | | |
|---|---|---|
| Troy Keith | -- | EFOM |
| Candice Jackson | -- | Geologist 3 |

## 1.5 PERMITS AND AUTHORIZATION REQUIREMENTS

Authorization for access and permission to sample shall be obtained from all property owners prior to sampling.

| Agency/Party | Permit/Authorization |
|---|---|
| David Hall (DDM Warehousing LLC) | Authorization from David Hall |
| Ray Seaton (Seaton Metals) | Authorization from Ray Seaton |
| Euro (Tenn) Inc. | Authorization from Brian Pinkney |
| William C. Robinson | Authorization from Mr. Robinson |
| Danny Blevins | Authorization from Mr. Blevins |

## 1.6 SITE HISTORY

Location

The Athens Furniture, Inc. site is located at 1200 Frye Street in the City of Athens, McMinn County, Tennessee (Figure 1). The geographic coordinates are 35.2631N Latitude and 84.3346W Longitude (Appendix A) (Figure 2). To reach the Site from Chattanooga, Tennessee; travel north on US Hwy 75 toward Knoxville, Tennessee; take exit 49 (TN-30) toward Athens/Decatur; turn right onto Decatur Pike (TN-30 E) / David W. Lillard Memorial Highway; travel approximately 2.5 miles; turn right onto Maple Street; turn left onto Frye Street. The property boundary of the site begins at the corner of Maple Street and Frye Street (Reference 1).

Site Description

The total area of the Site is approximately 27 acres (Appendix A). The site is moderately sloping from north to south and is occupied by several warehouses, buildings, tanks and fire damaged dilapidated facilities once utilized by Athens Furniture, Inc. The site has been subdivided into 10 parcels (Figure 1). The parcels include original buildings used by the furniture company. New construction has occurred on parcels located at the northwest property boundary. The site is currently unoccupied with the exception of a scrap metal warehouse, owned by David Russell Seaton. The original footprint of the site is bounded by railroad tracks to the south, Frye Street to the north, Matlock Street to the east and the Hammond Cemetery and Old Riceville Road to the west.

McMinn County is characterized by a mild, temperate climate. Summer temperatures are warm and humid with daily temperatures reaching 75°-80° F. The winter months are generally mild and characterized by frequent rain and short cold spells, with the high temperatures reaching 42°-45° F. The average annual precipitation is approximately 51" (Reference 2).

Operational History and Waste Characteristic

Athens Furniture, Inc. originally began operations in 1905 from a livery stable that was converted into a furniture plant named "Athens Table and Manufacturing Company" (Reference 3). Athens Table and Manufacturing Company produced wood living room furniture and solid oak and maple tables and accents. In the late 1920's, the name was changed to Athens Table Company. In 1945, Athens Bed Company began operations as a promotional bedroom furniture manufacturer. In 1968, the Athens Table Company combined with the Athens Bed Company to create Athens Furniture, Inc. (Reference 3).

Two plants once operated on the property, the Bed Plant and Dimension Plant. Both plants manufactured hardwood furniture beginning from uncut lumber, which was shaped and sanded. The Bed Plant used stains and lacquers that were applied using spray guns. The solvent blend used for all applications contained methyl ethyl ketone, toluene, methanol, other alcohols and petroleum naphtha (Appendix A). When workers changed stains, the spray guns were cleaned by dipping them into a bucket of lacquer thinner. Spray guns were also cleaned at the end of each workday (Appendix A).

The Dimension Plant was located adjacent to the Bed Plant, and began manufacturing wooden desks in 1978. Acetone was used to clean rollers that applied a base coat to desktops and lacquer thinner was used to clean spray guns. Spent acetone and lacquer thinner were poured into 55-gallon drums, which accumulated outside at the rear of the plant, at an unknown location. The Dimension Plant contained a boiler, which primarily burned wood trimmings and hazardous waste as fuel. The Dimension Plant burned wood scraps too large for their baghouse in an outside pit (Appendix A). DSWM records dated March 7, 1990, indicate that acetone waste from the Dimension Plant was the primary largest single hazardous waste source from Athens Furniture, Inc. However, the manufacturer had acquired a boiler air pollution permit and had reduced their hazardous waste to approximately one 55-gallon drum per month (Appendix A, (Reference 8)).

A leak/spill of approximately 1000 gallons of furniture sealant material was reported to the Division of Solid Waste Management on January 5, 1998. The Division of Solid Waste Management (DSWM) records indicate the leak was in an underground transfer pipe near a concrete tile which allowed the material to flow to an open concrete ditch (approx. 210' long) running between two buildings. The material then entered an open dirt drainage area leading away from the building alongside a railroad track (Appendix A). The remaining material had solidified and was shoveled up and placed into 55-gallon drums for proper disposal. Correspondence from Athens Furniture, Inc., dated January 6, 1998, reporting the spill, indicates they intended to burn the remaining material in their boiler under their boiler air pollution permit (Appendix A, (Reference 8)).

| Hazardous Waste Products |
| --- |
| Acetone |
| Stains and Lacquers |
| Solvent blends including methyl ethyl ketone, toluene, methanol, other alcohols and petroleum naphtha |
| Light Oil |

## 1.7 SITE HYDROGEOLOGY

The Athens Furniture, Inc. site is sloping north to south. Drainage from the site appears to flow south and southeast from several points and enters dirt ditches along parcel boundaries. Once entering these ditches, the water is transported to the storm sewer system and then discharged into the Oostanaula Creek located at the intersection of N. Jackson Street and Green Street approximately one mile from the site (Appendix A, (Reference 12)).

McMinn County is located within the Valley and Ridge physiographic province. Elongated valleys trending northeast to southwest and ridges composed of Paleozoic carbonate and clastic rocks, predominately consisting of limestone, dolomite, shale and sandstone, characterize the Valley and Ridge. Ridges consist of erosion resistant sandstone and cherty soils, while the valleys are underlain by more erosion prone limestone, dolomite, and shale. (Appendix A, (Reference 3, 13)). The rocks of the Valley and Ridge Province have been subjected to thrust faulting and are typically folded elongated anticlines and synclines resulting in moderate to steep angles of dip (Appendix A, (Reference 9)).

The Chepultepec dolomite, of the Knox Group, underlies the facility. The Chepultepec dolomite is fine to medium grained, light tan to gray, and is estimated to be approximately 700 feet thick in the Cleveland, Tennessee area. Beneath the Chepultepec dolomite lays the Copper Ridge dolomite, estimated to be approximately 1,000 feet thick in the Cleveland area. The Copper Ridge dolomite consists of dark crystalline, massive dolomite, which is commonly asphaltic.

Following the Copper Ridge dolomite is the Conasuaga Group, and is composed of the Maynardville limestone at the top, the Nolichucky shale in the middle, and the lower siltstone and shale sequence at the base (Appendix A, (Reference 9)).

The primary pathway for groundwater flow would be expected to occur within the fractures and voids in the bedrock. These pathways tend to decrease in size and abundance with increase in depth (Appendix A, (Reference 9)). These formations have considerable amounts of sand in the bedrock, as well as an appreciable content of iron. Tellico, Steekee, and Red Hills soils are predominant in the uplands. Alcoa soils are on the stream terraces and foot slopes in the area, followed by Neubert soils on the flood plains (Appendix A, (Reference 3)).

## 2.0 SAMPLING INVESTIGATION

Athens Furniture, Inc. manufactured solid wood furniture from uncut lumber at its facility in Athens, Tennessee (Appendix A). Contaminates from the use of various solvents and sealants may have been improperly stored or disposed of on the property. Terry Whalen and Joe Hartman responded to a complaint in 1987. The citizen residing nearby on Virginia Ave, Athens, TN, contacted the Division of Water Pollution Control Chattanooga Field Office on November 30, 1987, complaining of a foul smelling material located in a ditch behind her home. The eyewitness stated the material was originating from "a furniture company", and that the city would not do anything about it (Reference 4). A letter dated January 12, 1988 from the Division of Water Pollution Control, states that the complaint investigation was traced to a culvert discharge from Athens Furniture adjacent to Matlock Road. The letter further states that the brown wastewater originated from a rag washing operation located in a boiler room central to the two plants. The wastewater was being discharged into a continuous waste stream of boiler blowdown, which flowed through a culvert into a drainage ditch at Matlock Road (Reference 5, Reference 6). The wastewater was reported to have a linseed oil base and contained brown pigment (Reference 5). A sample was collected of the wastewater discharge, and additional potential violations were noted by inspectors, including the following:

- Paint spray booth water was pumped from seven booths, approximately weekly, into a drainage ditch paralleling the railroad tracks located behind the site (Reference 5).
- Contamination was evident in the drum storage area, by the presence of an overturned drum (Reference 5, Reference 6).
- The mixing pump room contained a floor drain that was connected to the outside, and past spillage was evident in the storm drainage ditch and pump room (Reference 5).
- Oil residues were observed on the ground adjacent to the mixing room (Reference 5).

Analytical results from the wastewater samples collected confirm the presence of toluene, ethylbenzene, xylenes, and methyl ethyl ketone (MEK) (Reference 7).

In addition to the potential presence of contaminants resulting from manufacturing processes, asbestos, polychlorinated biphenyls (PCBs) and lead contamination may be of concern at the site. In 2001, one of the buildings burned and was later demolished. Material still remains onsite from the demolition of that building. Randall Harrison from the Tennessee Department of Environment and Conservation (TDEC), Air Pollution Control Division has been contacted regarding the suspected asbestos contamination at the site. Mr. Harrison is anticipated to inspect the site during the Site Inspection sampling activities. Depending on the results of Mr. Harrison's inspection, additional soil samples may be collected and analyzed for asbestos.

Inspection of the site on January 25, 2007, revealed that several large transformers had been vandalized onsite (Reference 8). Athens Utility Board (AUB) owns the transformers onsite, and provided documentation for the required removal of the transformers and subsequent cleanup activities (Reference 9). Analytical results provided by AUB identify one of the transformers vandalized, having contained PCB contaminated oil with a level of 14 parts per million (ppm) Aroclor 1260.

## 2.1 SURFACE SOIL SAMPLING

Twelve surface soil samples will be collected from eleven locations, plus one duplicate sample, and one MS/MSD sample. The samples will be collected from areas that are suspected to be source areas or are down gradient from suspected source areas (i.e. overland flow paths) based on topography (Table 1, Figure 3). Sample locations may be adjusted in the field based on conditions encountered.

The background sample will be collected topographically upgradient and north of the site. Efforts will be made to collect the background sample from an area of similar soil type and in an area believed to be unaffected by Site activities.

## 2.2 SURFACE WATER and SEDIMENT SAMPLING

Surface water samples will not be collected since there is no evidence of an active release. Evidence of a release will be evaluated through sediment sampling.

Two sediment samples will be collected from three locations, plus one duplicate sample, and one MS/MSD sample (Table 1; Figure 3). Sample locations may be adjusted in the field based on conditions encountered or if new information becomes available.

## 2.3 AIR SAMPLING

Considering the facility in no longer operating, this pathway will not be evaluated.

## 2.4 GROUNDWATER SAMPLING

Groundwater samples are not currently planned as part of this investigation due to the low probability that contaminants would be present at the nearsest supected residential well location, which is in excess of one mile from the site (Appendix A, (Reference 12)).

**Table 1**

| SAMPLE # | LOCATION | ANALYSIS | RATIONALE |
|---|---|---|---|
| **AFI - SS – 01** | Up-gradient of Site | VOC's, SVOC's, Metals, PCB's | Background surface soil sample for comparison to down gradient surface soil sample results. |
| **AFI - SS – 02** | Near the former AST area. | VOC's, SVOC's | Determine the presence or absence of a release from the AST area |
| **AFI - SB – 02** | Near the former AST area. | VOC's, SVOC's | Determine the presence or absence of substance in the sub-surface |
| **AFI - SS – 03** | Down gradient of the former AST area. | VOC's, SVOC's | Evaluate the overland flow pathway from the AST area |
| **AFI - SS – 04** | Behind the former lumber grading building. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS – 05** | Near the Bedding Plant manufacturing building. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS – 06** | Near the boiler house. | VOC's, SVOC's, Metals | Determine the presence or absence of substance |
| **AFI - SS – 07** | Near the Dimension Plant. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS – 08** | Down gradient of the Dimension Plant. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS – 09** | Electric tranformer vandilization area No. 2 | VOC's, SVOC's, PCB' | Determine the presence or absence of substance. |
| **AFI - SS – 10** | Electric tranformer vandilization area No.1 | VOC's, SVOC's, PCB' | Determine the presence or absence of substance |
| **AFI - SS – 11** | Down gradient of the Bedding Plant. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS – 12** | Down gradient of the Bedding Plant. | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SD – 01** | Downstream of Site | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SD – 02** | Downstream of Site | VOC's, SVOC's | Determine the presence or absence of substance |
| **AFI - SS - 13** | Duplicate of Sample SS-08 | VOC's, SVOC's | Quality Assurance / Quality Control |
| **AFI – SS – 04 - QC** | MS/MSD for Sample SS-04 | VOC's, SVOC's | Quality Assurance / Quality Control |
| **AFI - RS – 01** | Rinsate Blank | VOC's, SVOC's, Metals | Quality Assurance / Quality Control |
| **AFI - PB – 01** | Preservative Blank | VOC's, SVOC's, Metals | Quality Assurance / Quality Control |

Note: "A" at the end of the Sample ID means that the sample was collected from 0 – 6 inches below ground surface (bgs).

## 2.5 SAMPLE CODING

Samples will be appropriately coded as follows:

**TABLE: STANDARD SAMPLE CODES**

| Samples |
|---|
| SD - Sediment |
| SB - Subsurface Soil |
| SS - Surface Soil |
| QC - Quality Control |
| RS - Rinsate Blank |
| PB - Preservative Blank |

**TABLE: OTHER POSSIBLE SAMPLE CODES**

| | |
|---|---|
| WA - Waste | TB - Trip Blank |
| DR - Drum | FB - Field Blank |

All sample codes will consist of at least six characters in the following format:

Site Name - Sample Type - Sample Number – Sample Depth

Example: Athens Furniture, Inc. - Surface Soil Sample - Number 05, 0-6 inches

Appropriate Code: AFI - SS – 05

Example: Athens Furniture, Inc - Subsurface Soil Sample - Number 05, 6-12 inches
Appropriate Code: AFI - SB – 05

The Duplicate samples will be disguised to resemble regular samples in order to ensure non-biased laboratory results.

## 2.6 ANALYSES REQUESTED/CONTRACT LABORATORY

Depending on the specific sample location at the Site, the sample will be analyzed for the suspected contaminants; samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals. Analysis for PCBs will be performed on samples collected from areas previously identified in Table 1, as AFI–SS-14 and AFI-SS-15. Analyses will be performed by the EPA Region 4 Science and Ecosystem Support Division Laboratory located in Athens, Georgia or through EPA's Contract Laboratories Program as assigned by EPA. Preservative blank and Rinsate Blank samples will also be submitted for analysis.

## 2.7 ANALYTICAL AND CONTAINER REQUIREMENTS

Sample containers used will be in accordance with the requirements specified in the U.S. EPA, Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), dated November 2001.

The following table is a description of the analyses and types of containers required:

| Analysis | Container | Preservatives |
|---|---|---|
| Volatiles (VOCs) Soil/Sediment | 8 oz. Widemouth Glass Jar (1 per sample) | Ice (~ 4°C) |
| Semi-Volatile (SVOCs) Soil/Sediment | 8 oz. Widemouth Acetone Rinsed Glass Jar (1 per sample) | Ice (~ 4°C) |
| Metals, Soil/Sediment | 8 oz. Widemouth Glass Jar (1 per sample) | Ice (~ 4°C) |
| PCBs | 8 oz. Widemouth Glass Jar (1 per sample) | Ice (~ 4°C) |
| Rinsate Blank - Metals | 1 L Polyethylene Container | HNO3 (pH<2), Ice (~ 4°C) |
| Rinsate Blank – Ext. Organics | 2 1-L Amber Glass Containers | Ice (~ 4°C) |
| Preservative Blank | 1 L Polyethylene Container | HNO3 (pH<2), Ice (~ 4°C) |

## 2.8 GENERAL METHODOLOGY

All sample collection, sample preservation, and chain of custody procedures used during this investigation will be in accordance with the standard operating procedures as specified in Section 3 and 4 of the EISOPQAM.

All laboratory analyses and laboratory quality assurance procedures used during this investigation will be in accordance with standard procedures and protocols as specified in the EISOPQAM or specified by the existing USEPA standard procedures and protocols for the contract analytical laboratory program.

## 3.0 FIELD HEALTH AND SAFETY PLAN

The purpose of this safety plan is to assign responsibilities, establish personnel protection standards, establish mandatory safety operating procedures, and provide for contingencies that may arise while conducting this Site screening investigation. All aspects of the field operations must comply with the USEPA "Standard Operating Safety Guides" section of Personnel Protection and Safety course manual and Occupational Safety and Health Administration regulations (29 CFR 1910.120).

### 3.1 SITE SAFETY OFFICER

The Site Safety Officer (SSO) for the investigation is Troy Keith. Designated alternate SSO is Candice Jackson.

The site safety officer will assure that appropriate personnel protection equipment is available and properly utilized by all members of the field investigation team. The SSO will also assure that proper emergency first aid equipment is available (eye wash station, first aid kit, etc). The SSO's responsibilities will include oversight in work practices that will insure personnel safety and correction of work practices or conditions that are or may appear to be hazardous. The SSO will have ultimate authority on all safety decisions and can suspend investigation operations if required safety procedures are not followed or if conditions become too hazardous for the level of protection provided.

### 3.2 PROTECTIVE CLOTHING

Level D protective clothing will be used in all on-site investigative personnel. The following constitutes Level D equipment for this Site:

Chemical resistant boots or shoes with steel toe and shank, latex-gloves (disposable), safety glasses or goggles and hard hats (if personnel are exposed to overhead hazards).

### 3.3 SAFETY EQUIPMENT

The following equipment will be available on Site: eyewash station, and first aid kit.

### 3.4 SITE SPECIFIC SAFETY INSTRUCTIONS

The Site Safety Officer will monitor each employee involved in Site sampling for fatigue. Any employee suspected of being too hot or fatigued will be removed from the area and evaluated to determine if further action is necessary. Potable water will be available for use by all personnel.

In case of an emergency, the directions to Athens Regional Medical Center are as follows (Figure 4):

**Start: 1200 Frye Street**
Athens, TN 37303-3052, US

**Route:**

| | Directions | | Distance |
|---|---|---|---|
| START | 1: | Start out going EAST on FRYE ST toward the Intersection of FRYE ST. AND WESTSIDE AVE. | <0.5 miles |
| | 2: | Follow FRYE ST.TO COOK DR. | 0.1 miles |
| | 3: | Turn RIGHT onto W MADISON AVE / US-11 BR / TN-39. | <0.1 miles |
| END | 4: | End at **Athens Regional Medical Ctr:** 1114 W Madison Ave, Athens, TN 37303, US | |

**Total Est. Time:** 1 minute
**Total Est. Distance:** 0.5 miles

**End: Athens Regional Medical Center**: 423-778-5900
1114 W Madison Ave, Athens, TN 37303, US


**Figure 4:** **VIEW OF ROUTE FROM FRYE STREET TO ATHENS REGIONAL MEDICAL CENTER**

## References

1. Directions to Site:
http://www.mapquest.com/directions/main.adp?go=1&do=nw&rmm=1&un=m&cl=EN&ct=NA&rsres=1&1ffi=&1l=&1g=&1pl=&1v=&1n=&2ffi=&2l=&2g=&2pl=&2v=&2n=&1pn=&1a=&1c=chattanooga&1s=tn&1z=&2pn=&2a=1200+Frye+St.&2c=Athens&2s=tn&2z=&r=f

2. United States. Department of Agriculture. Soil Conservation Service in Cooperation with Tennessee Agricultural Experiment Station Tennessee Valley Authority. Soil Survey McMinn County Tennessee. Series 1948 no.4 p.5: 1957.

3. (1980. April). Athens: 75 Years of Value and Service. *Know Your Sources, 130-133.*

4. Record of Complaint.

5. Letter to Pete Stieb, President of Athens Furniture, Inc. from the *Division of Water Pollution Control* dated January 12, 1988.

6. Site Photos – December 17, 1987.

7. Analytical Results from Sampling activities conducted on December 17, 1987.

8. Site Photos - January 25-26, 2007.

9. Documentation provided by Larry Monteen from Athens Utility Board (AUB).

## Appendices

A. Tennessee Division of Superfund Chattanooga Environmental Assistance Center. *Preliminary Assessment Athens Furniture Industries, Inc.,* March 27, 2003.

## Figures

**Reference 1**

Directions to Site:
http://www.mapquest.com/directions/main.adp?go=1&do=nw&rmm=1&un=m&cl=EN&ct=NA&rsres=1&1ffi=&1l=&1g=&1pl=&1v=&1n=&2ffi=&2l=&2g=&2pl=&2v=&2n=&1pn=&1a=&1c=chattanooga&1s=tn&1z=&2pn=&2a=1200+Frye+St.&2c=Athens&2s=tn&2z=&r=f

MAPQUEST.

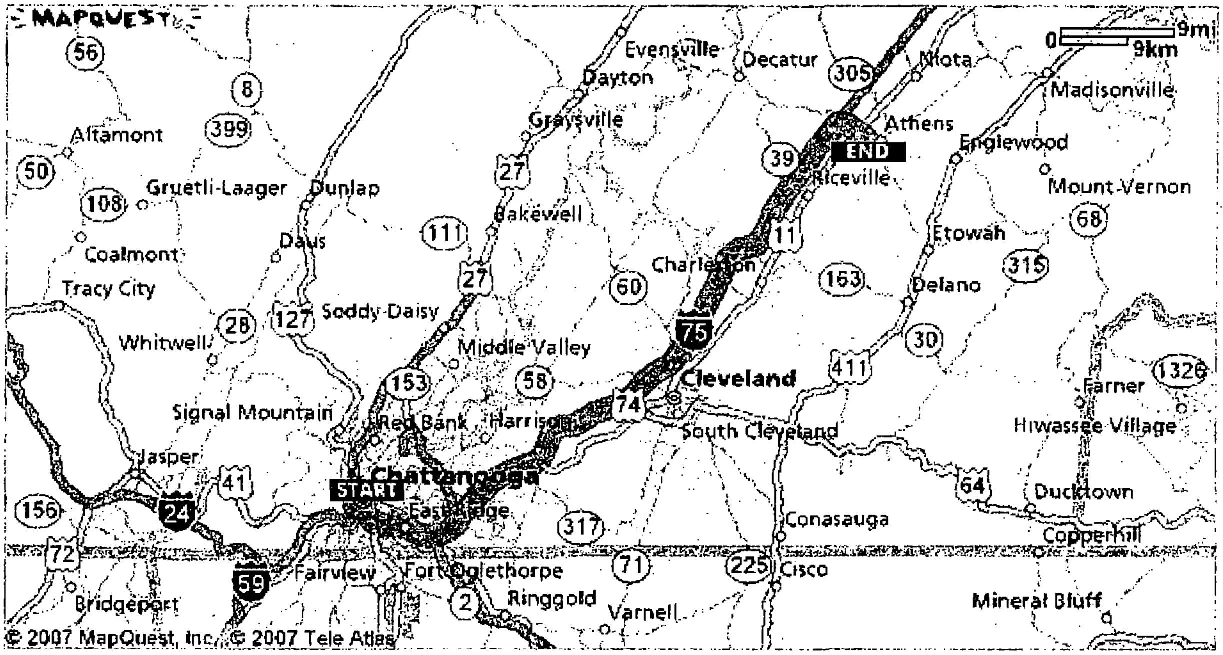
**Start:** **540 Mccallie Ave**
Chattanooga, TN 37402-2089, US

**End:** **1241 Frye St**
Athens, TN 37303-3055, US



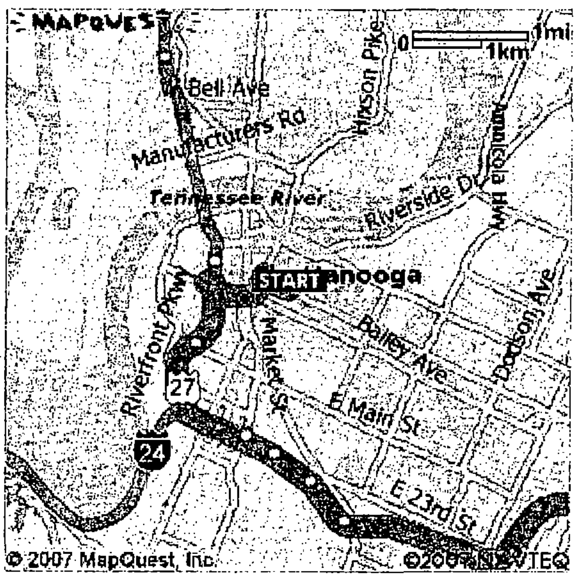
**Notes:**

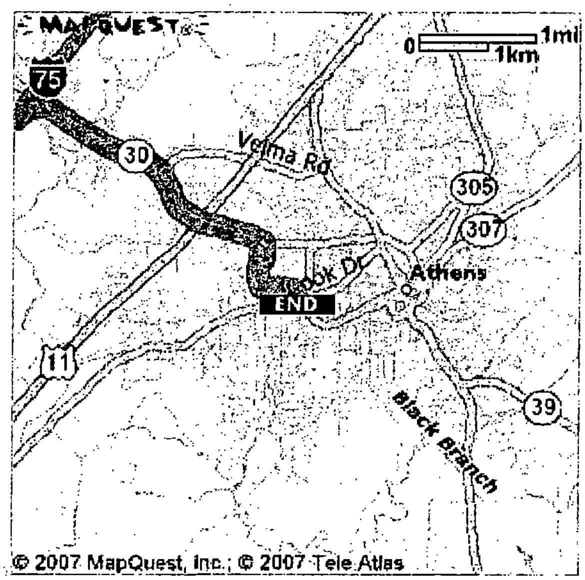
| Directions | Distance |
|---|---|
| **Total Est. Time:** 1 hour, 3 minutes **Total Est. Distance:** 59.55 miles | |
| START **1:** Start out going NORTHWEST on MCCALLIE AVE / US-11 / TN-2 toward HOUSTON ST. | 0.2 miles |
| **2:** Turn LEFT onto GEORGIA AVE / US-11 / TN-2. | 0.1 miles |
| **3:** Turn RIGHT onto E MARTIN LUTHER KING BLVD / US-11 / TN-2 / E 9TH ST. Continue to follow E MARTIN LUTHER KING BLVD. | 0.4 miles |
| SOUTH 27 **4:** Merge onto US-27 S. | 1.0 miles |
| EAST 24 **5:** Merge onto I-24 E via the exit on the LEFT toward ATLANTA / KNOXVILLE. | 6.8 miles |
| NORTH 75 **6:** Merge onto I-75 N via EXIT 185B on the LEFT toward KNOXVILLE. | 47.5 miles |
| 49 EXIT **7:** Take the TN-30 exit- EXIT 49- toward ATHENS / DECATUR. | 0.2 miles |
| EAST 30 **8:** Turn RIGHT onto DECATUR PIKE / TN-30 E / DAVID W LILLARD MEMORIAL HWY. | 2.2 miles |
| **9:** Turn RIGHT onto MAPLE ST. | 0.3 miles |
| **10:** Turn LEFT onto FRYE ST. | 0.3 miles |
| END **11:** End at **1241 Frye St** Athens, TN 37303-3055, US | |
| **Total Est. Time:** 1 hour, 3 minutes **Total Est. Distance:** 59.55 miles | |




**Start:**
**540 Mccallie Ave**
Chattanooga, TN 37402-2089, US

**End:**
**1241 Frye St**
Athens, TN 37303-3055, US



**Reference 2**

United States. Department of Agriculture. Soil Conservation Service in Cooperation with Tennessee Agricultural Experiment Station Tennessee Valley Authority. Soil Survey McMinn County Tennessee. Series 1948 no.4 p.5: 1957.

Series 1948, No. 4

Issued October 1957

# SOIL SURVEY

# McMinn County Tennessee

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION
TENNESSEE VALLEY AUTHORITY

Limestones are the predominant rocks in McMinn County and shale is second in extent. More than 50 square miles are underlain by sandstones. Some areas are high in lime; others are acid. The soils from calcareous sandstone, however, have been leached of most of their lime and are largely strongly acid. Both the limestones and shales vary a great deal from place to place. In greater part, the limestones are dolomitic. In many places these dolomitic limestones contain considerable chert, in some places sand, and in other places both chert and sand. Some limestones also contain clay. Some of the shales are high in lime (calcium carbonate) and others are acid. In some places, also, layers of shale are interbedded with limestone.

The relief of the county is prevailingly undulating, rolling, and hilly, although it ranges from nearly level to very steep. The part of the county located in the Great Valley is predominantly rolling to hilly. In most places the difference in elevation between the valleys and the adjacent hills and ridges ranges from 100 to 200 feet. The bulk of the county lies between 800 and 1,100 feet above sea level. The lowest part along the Hiwassee River is approximately 700 feet. Chickamauga Reservoir on this river is about 683 feet. Some of the highest ridges in the valley part reach 1,300 feet. Starr Mountain has an elevation of about 2,200 feet in this county.[3]

In McMinn County surface drainage of the upland is well developed. Slow surface drainage is confined almost wholly to bottom lands. Drainage is largely southwestward into the Hiwassee River. A small area in the northern part of the county is drained by small streams flowing north and west. Many of these small streams cease to flow during the driest part of the year. A considerable part of the limestone areas is drained through underground channels from sinkholes. In the shale areas the drainage pattern is mildly dendritic, but in the limestone areas the pattern is less uniform. There are no large natural lakes in the county, although some sinkholes retain water part or all of the time.

## Climate

The climate of McMinn County is of the humid continental type. The winters are not long and have frequent rainy periods and short cold spells. The moderate winter and summer temperatures make outdoor farm work possible much of the time. Data on the normal monthly, seasonal, and annual temperature and precipitation compiled from records of the United States Weather Bureau Stations at Etowah, McMinn County, and Charleston, Bradley County, Tenn., are given in table 1.

The average frost-free season is 195 days, from April 11 to October 23. A large proportion of the peach buds are killed about every 2 out of 3 years by the frosts, and the apple and berry buds are severely damaged about half of the time. Yields of late-maturing cotton are sometimes reduced by early frosts. The grazing period extends from about April 1 to the latter part of November.

As shown by table 1, the wettest period is during the winter and early spring months, and the driest is during the late summer and early fall months. Danger from flooding is greatest during the late winter and early spring and least during the late summer and early fall. Local flash floods, however, may be expected throughout the growing season. Damage of crops by hailstorms and strong winds is infrequent. Occasional light snowfalls occur during the winter but melt within a day or two. The ground is seldom frozen to a depth of more than 2 or 3 inches or for more than 3 or 4 days at a time. Such hardy vegetables as turnip greens, mustard, and onions persist throughout the winter.

In general, the climate is particularly favorable for early maturing crops and for those crops that require a long growing season and can withstand dry weather during their later growth and maturing periods. Fall-sown small grains are an example of the early maturing crops that are well suited. The winters are sufficiently mild for good stands throughout the winter season, and the spring temperature and moisture supply are exceptionally favorable for early maturity. Cotton, corn, lespedeza, and tobacco are examples of the long-season crops that can persist throughout dry periods during the late-development and maturity period. On the other hand, potatoes, especially late potatoes, are an example of a crop that apparently is not as well suited to the prevailing climate in McMinn County as to that in certain other sections. In many areas there is enough moisture to produce large yields of strawberries, but in others dry weather early in the growing season prevents proper development.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation*

| Month | Average temperature[1] | Precipitation[2] | | |
|---|---|---|---|---|
| | | Average | Driest year (1904) | Wettest year (1909) |
| | *F.* | *Inches* | *Inches* | *Inches* |
| December | 42. 7 | 5. 13 | 4. 49 | 4. 89 |
| January | 42. 5 | 5. 19 | 2. 34 | 4. 06 |
| February | 45. 4 | 4. 83 | 3. 02 | 8. 50 |
| Winter | 43. 5 | 15. 15 | 9. 85 | 17. 45 |
| March | 51. 0 | 5. 68 | 6. 28 | 7. 54 |
| April | 60. 1 | 4. 49 | 1. 60 | 5. 09 |
| May | 68. 9 | 3. 86 | 3. 40 | 10. 53 |
| Spring | 60. 0 | 14. 03 | 11. 28 | 23. 16 |
| June | 76. 3 | 4. 07 | 3. 78 | 13. 83 |
| July | 79. 6 | 4. 50 | 2. 84 | 6. 29 |
| August | 79. 1 | 3. 75 | 4. 96 | 2. 58 |
| Summer | 78. 3 | 12. 32 | 11. 58 | 22. 70 |
| September | 74. 6 | 2. 64 | 1. 08 | 2. 49 |
| October | 61. 8 | 3. 10 | . 06 | 3. 73 |
| November | 50. 3 | 3. 88 | 3. 04 | . 70 |
| Fall | 62. 3 | 9. 62 | 4. 18 | 6. 92 |
| Year | 61. 0 | 51. 12 | 36. 89 | 70. 23 |

[1] Temperature based on a 10-year record, 1936–1945, at Etowah, McMinn County, Tenn.

[2] Precipitation based on a 72-year record, through 1955, at Charleston, Bradley County, Tenn.; wettest and driest years based on a 57-year record, in the period 1889–1955, at Charleston.

[3] Elevation data from United States Geodetic Survey-Tennessee Valley Authority topographic maps.

**Reference 3**

(1980. April). Athens: 75 Years of Value and Service. *Know Your Sources, 130-133*

KNOW YOUR SOURCES

# Athens: 75 Years of Value and Service

**Athens Furniture, Inc. sells to 8000 accounts, including 15 of the 25 largest retailers in the nation.**

In 1980, Athens Furniture, Athens, Tennessee, celebrates its 75th Anniversary, a rare milestone in today's hectic business world.

Athens' beginning dates back to 1905, when a livery stable was converted to a furniture plant and named "Athens Table and Manufacturing Company." Since then, Athens has grown consistently to its present position as one of America's most respected furniture manufacturers.

The initial product line consisted primarily of oak tables, accent furniture, and postmaster's desks. For the entire 75 years since, the firm has continued to produce wood living room furniture, and today specializes in solid oak and maple tables and accents. Some of its curios, hall trees, and tea carts are literally produced "by the thousands" every month.

By the late 1920's, the original factory employed over 200, becoming one of the largest employers in the small East Tennessee town. The firm operated right through the depression, although it did go through a reorganization and name change to Athens Table Company. In recent years, Athens Table Company's facilities have been completely rebuilt, modernized, and expanded. Today it is a modern, efficient manufacturing unit that shows little evidence of its 75 year history.

*Basil Turbyfill, president of Athens Furniture, Inc., explains that "Special consideration for customers' needs has been responsible for the company's growth."*

In 1945, Athens Bed Company began operations as a promotional bedroom furniture manufacturer. It, too, enjoyed success, but other than being located in the same town, had no relationship to the older "Table Company." In 1968, the firms were combined by ownership and management.

The "Bed Company" has also established itself in some unique ways. For example, it has one bedroom suite that has been among the nation's best sellers since its introduction in 1963. The firm is also one of the top producers of bunk beds in the country.

The newcomer in the Athens Furniture family is Furniture Craft, its desk plant. Athens began producing desks for home use in 1965, and in 1978 completed a new, totally independent plant solely for desk production. Desk sales in 1979 were 65% ahead of projections.

In March, 1980, two years after completion of the new desk plant, an expansion increasing floor space by 50% was completed, making Athens one of the top home desk manufacturers in the industry.

Athens' desk plant produces more than 50 different sizes, styles, and finishes in the $149 to $499 retail range.

"In the past four years our sales volume has doubled," states Basil Turbyfill, president. "We are now selling 15 of the 25 largest retailers in the nation, and 8000 retailers in all. All three of

**We evaluate every new design carefully before it is offered to our customers.**

*Richard Waddell*
*Vice President/Sales & Mktg.*

*Claude Best*
*Director of Design*

*Peter Van Ness*
*Vice President & Controller*

our plants are well-positioned to continue this growth rate and serve our customers' increasing needs in the 80's."

Turbyfill, a graduate of the Furniture Manufacturing and Management curriculum at North Carolina State University and the Harvard Graduate School of Business Administration, has been in Athens 21 years. He became president of Athens Table Company in 1968, and assumed the top position of the combined companies six years ago. Other members of Athens' Management team are:

Peter Van Ness, vice president and controller, has been with Athens 5 years, and is a graduate of the U.S. Naval Academy with an MBA from the University of Florida.

Richard Waddell, vice president of sales and marketing, has a law degree from The University of Tennessee and left his law practice to join the Athens firm 11 years ago.

Claude Best, director of design, has been with Athens 6 years, has a Degree in Design from The University of Cincinnati and 26 years of experience in the furniture design profession.

Filling out the Management team are Eddie Morris, sales manager for the Bedroom and Desk product lines, and Ray Cranfield, sales manager of the Table and Accent lines.

*Scene of nostalgia on North Jackson Street in Athens in 1916 pictures the furniture plant as only a few remember it.*

**Product Development**

Turbyfill explains, "Special consideration for customers' needs has been responsible for our growth. We evaluate every new design carefully before it is offered to our customers. Our accent furniture has to be more 'functional' than 'dressy.' Our hall tree, for example, doesn't just dress up a wall, it has a shelf, a marble top, and a drawer plus the other features you expect to see in a hall tree."

"Also," he continues, "we solicit orders for one piece just as aggressively as we do for carloads. This is a 'people' business from start to finish, which is why we enjoy it so much."

Athens employs over 650 people in three separate plants

## Athens is dedicated to tomorrow, realizing they have to work harder and smarter than ever.

with over a half million square feet of production space and 50 acres of land. Each plant is a totally independent manufacturing unit, with its own production management team, identity, and profit responsibility.

The corporate structure — Athens Furniture, Inc. — comes into play in the areas of finance, personnel, sales, and administration.

The three-plant, separate responsibility, and separate

**Athens' product line approach is different from most multiple plant organizations.**

product line approach is different from most multiple plant organizations. Explains Turbyfill, "This structure minimizes the adverse effects of economic slumps and gives Athens greater ability to maximize total overall performance."

### April Plans

For several months, Athens' management has been working on some new adult bedroom groups that offer outstanding values and promotional possibilities. Engineering changes, equipment additions, and sophisticated production methods are being installed at this time to assure Athens' customers of service on these groups.

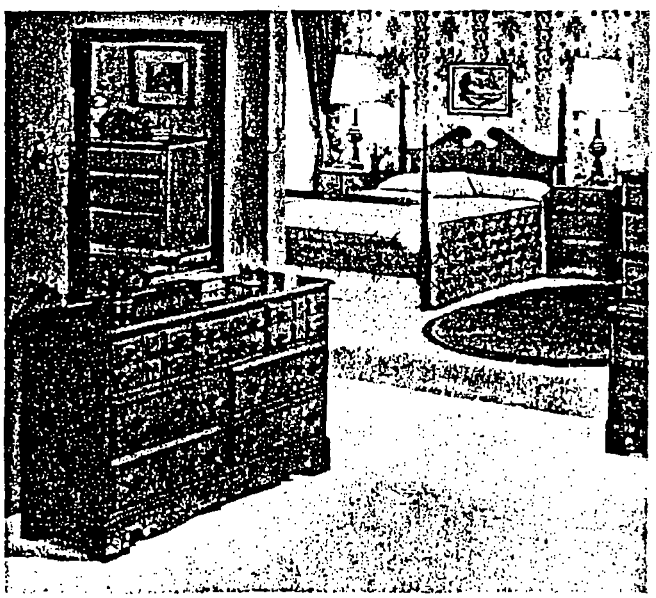
Athens takes pride in the fact that it has customers, such as Rosenbush Furniture in Demopolis, Alabama, that have been doing business with Athens since DAY ONE — 75 years ago.

At the same time, Athens' management is dedicated to tomorrow, realizing that in today's competitive climate, working smarter and harder is essential to make the next quarter century as gratifying as the first three quarter centuries were.

*Work force as pictured in 1916 didn't depict that Athens was on its way to becoming one of the largest employers in the small East Tennessee town.*

*By 1929, when this picture was taken, Athens' work force had grown considerably as it continued to do — and does today.*


*This 1916 advertisement picturing Athens' tables and its plant ran in a special salute to industry in the local newspaper that year.*



*The 2000 Group by Athens remains one of the company's all time best sellers. The simplistic Colonial styling and its value for dollar helps it to maintain its position on the retail floor and with the consumer. Circle No. 183*

**Reference 4**

Record of Complaint

TENNESSEE DEPARTMENT OF HEALTH & ENVIRONMENT
DIVISION OF WATER POLLUTION CONTROL
CHATTANOOGA FIELD OFFICE
PUBLIC INPUT FORM

Input No: 87-505

Date Received: 11/30/87

Type of Input: Complaint ✓ Spill_____ R/A_____ Other_____

Time: 3:40 PM

Refer to Input No. ______________

Received By: JDH

Received From: Mrs. Fred Snyder

Person to Contact: ______________

Company: ______________

Company: ______________

Address: 614 Virginia Ave. Athens

Address: ______________

Telephone: 745-1580

Telephone: ______________

Location of Problem:
Address: Behind above

Stream: ?

County: McMinn

Nature of problem, request, or notification: Mrs. Snyder said the ditch behind her house is full of a foul-smelling material ~~[illegible]~~ that comes from "a furniture company". She said the city will not do anything about it.

Action Committed To: (Continued, see page(s)_______attached)

N/A______ Investigate ✓ Refer — When? 12/3/87

Referred to: TFW

Signature: [illegible] Date: 11/30/87

Follow-Up Assigned to: ______________

6jdh.bjd
7/23/87

By: ______________, Date ______________

**Reference 5**

Letter to Pete Stieb, President of Athens Furniture, Inc. from the *Division of Water Pollution Control* dated January 12, 1988

TA

STATE OF TENNESSEE
DEPARTMENT OF HEALTH AND ENVIRONMENT
SOUTHEAST REGIONAL OFFICE
2501 MILNE STREET
CHATTANOOGA, TENNESSEE 37406-3399

January 12, 1988
Certified Mail

Mr. Pete Stieb, President
Athens Furniture, Inc.
10 Matlock Road
Athens, Tennessee 37303

Re: NOTICE OF NONCOMPLIANCE
Tennessee Water Quality Control Act
McMinn County

Dear Mr. Stieb:

On December 17, 1987, Terry Whalen and Joe Hartman of this Division met with your facility representative, Joe Lawson, during a complaint investigation concerning brown wastewater in a tributary to Oostanaula Creek. The wastewater was traced to a culvert discharge from Athens Furniture, Inc., adjacent to Matlock Road.

Mr. Lawson guided the State inspectors through areas of Athens Furniture's Frye Street and Matlock Road plants, the Desk and Bed Divisions, respectively. The brown wastewater originated from a rag washing operation located in a boiler room central to the two plants. Wastewater was being discharged into a continuous waste stream of boiler blowdown which flowed through a culvert into a drainage ditch at Matlock Road. A single washing machine was used to clean rags used for wiping during furniture glazing. The glaze (stain) was reported to have a linseed oil base and contained brown pigment. The inspectors obtained samples of the discharge at the Matlock Road culvert. Photographs were taken inside and outside of the plants. The inspection was conducted on an unannounced basis during a period of dry weather.

As was told to Mr. Lawson, the above described wastewater discharge constitutes a violation of Section 69-3-108 of the Tennessee Water Quality Control Act (copy enclosed), which forbids discharging without a permit. In addition, it is a violation of Section 69-3-114 of the Act for any person to discharge any substance into the waters of the State or to place or cause any substance to be placed in any location where such substances cause pollution to the waters of the State as defined in Section 69-3-103(22). Under Section 69-3-115 of the Act, violators are subject to a civil penalty of up to ten thousand dollars ($10,000) per day for each day during which a violation occurs.

In addition to the sampled wastewater discharge, other reported or potential discharges noted by the inspectors were as follows:

1. Paint spray booth water was pumped from seven booths, approximately weekly, into a drainage ditch paralleling the railroad tracks at the rear of the Matlock Road plant. The paint booth sludge residue has been evaluated by the Division of Solid Waste Management (DSWM) and granted special approval for landfill disposal. It was recommended by DSWM that the residue be dewatered in drums with holes punched in them. Although the spray booth and drum dewatering discharges were not observed during our inspection, when occurring, they would constitute violations of the Act.

2. Potential sources of water pollution, accessible by rainfall and susceptible to runoff, include the following:

   a. Drum storage area contamination was evident. One drum was overturned on its side with spray booth residue spilled out of it.

   b. The mixing pump room contained a floor drain connected to the outside. Past spillage was evident in the storm drainage ditch outside and continued spillage was evident inside the pump room.

   c. Oil residues were observed on the plant grounds adjacent to the mixing pump room.

   d. The stormwater drainage system contained several access points in the plants where spillage, conveyor dripping, and debris contamination were possible. The system contained a mix of enclosed PVC piping and accessible sub-floor trenches.

3. A puddle of clear water containing a trace oil sheen was observed adjacent to the Matlock Road plant. Two pipes were elbowed into the ground at that location and were identified by Mr. Lawson as the city water service connection and a sump pump discharge pipe from two elevator pits inside the plant. Since the elevator sumps did not appear to have been pumped of groundwater recently, Mr. Lawson suggested a possible leak in the water line. Mr. Lawson was told that the sump discharge would require evaluation to insure against contamination before discharge.

4. Mr. Lawson, when asked if he knew of any other wastewater discharges, stated that boiler blowdown and washing maching discharge existed at the Athens Occasional Plant, 909 N. Jackson Street. The discharges were reportedly into a closed storm drainage system. The Athens Occasional Plant was not inspected.

This letter will serve as a formal Notice of Noncompliance for the above described violations of the Tennessee Water Quality Control Act. This Notice constitutes the first step in enforcement procedure by this Division. Failure to comply with requirements of the Act will result in further enforcement including action to secure penalties as described above.

Since during the inspection Mr. Lawson was told that the unpermitted wastewater discharges were illegal and should be stopped immediately, we assume the discharges have ceased. Pursuant to Section 69-3-107(10) of the Act, please provide a written reply to this office within fifteen (15) days of receipt of this letter, responding to the following requested information:

1. Provide a complete inventory of all wastewater discharges from all Athens Furniture, Inc., facilities including discharge history, flow rate, and constitution.

2. Provide details of how and when the illegal discharges were stopped and if still continuing, when and how they will be stopped.

3. Provide details for preventing storm water contamination as referenced above.

4. Identify the clear water discharge described as a possible water line leak.

It was recommended at that time that Mr. Lawson contact the Athens Utilities Board as soon as possible to initiate a solution to the illegal discharges. It appeared that following pretreatment, connection to the city sewer system could effect a solution.

We appreciate the cooperation by Mr. Lawson during the inspection. Should you have any questions concerning this Notice or the required response, please contact Mr. Whalen at 615/624-9927.

Sincerely,

Philip L. Stewart
Manager, Chattanooga Field Office
Division of Water Pollution Control

PLS/TPW/tdm
Enclosure
cc: Division of Water Pollution Control, Nashville,
c/o Enforcement and Compliance Section
cc: Division of Solid Waste Management, Knoxville,
c/o Rick Brown
cc: McMinn County Health Department
1stieb.tpw

## Reference 6

Site Photos – December 17, 1987

Site Name: **Athens Furniture Industries, Inc.**
**Location: Athens, Tennessee**
**DoR Personnel Present: T. Whalen, J. Hartman**

**Site No. 33-688**
**Date: 12-17-1987**
**Prepared by: C. Jackson**

**Photo 1:** Drum Storage Area.

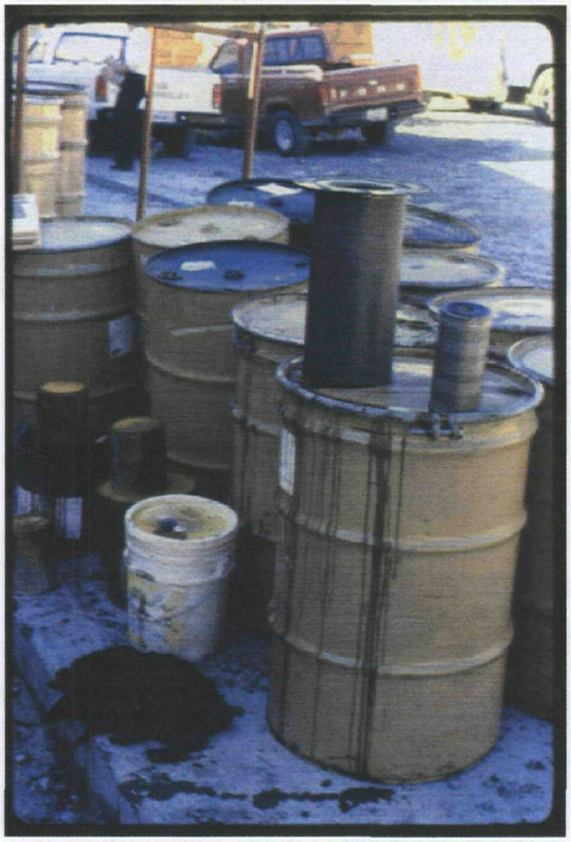


**Photo 2:** Drum Storage Area.

**Site Name: Athens Furniture Industries, Inc.**
**Location: Athens, Tennessee**
**DoR Personnel Present: T. Whalen, J. Hartman**

**Site No. 33-688**
**Date: 12-17-1987**
**Prepared by: C. Jackson**

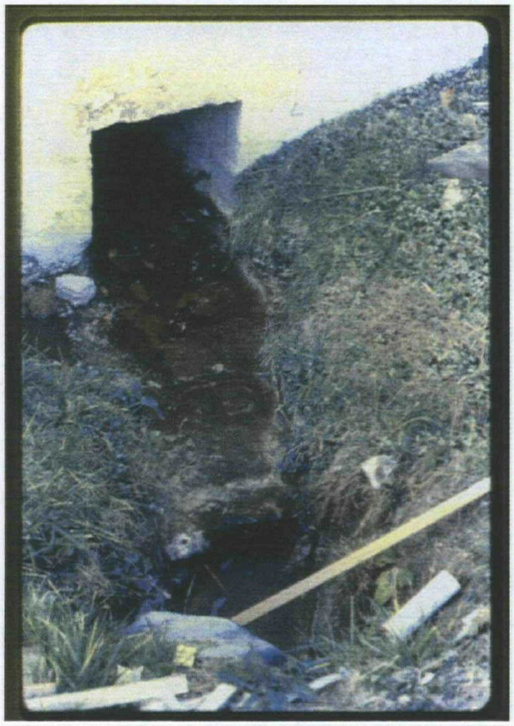


**Photo 3:** Boiler blowdown and wastestream located under the bed plant manufacturing building, exiting to culverts on Matlock Road.

**Photo 4:** Same as above, storm drain near Athens Furniture and Matlock Road.

Site Name: Athens Furniture Industries, Inc.
Location: Athens, Tennessee
DoR Personnel Present: T. Whalen, J. Hartman

Site No. 33-688
Date: 12-17-1987
Prepared by: C. Jackson

**Photo 5:** Same as above.

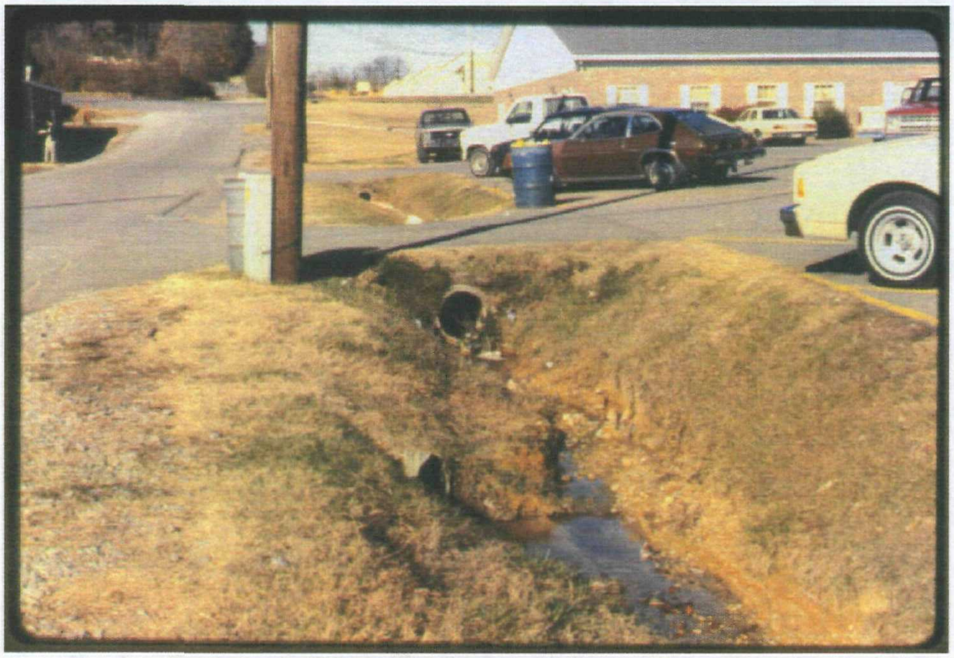


**Photo 5:** Same as above.

**Reference 7**

Analytical Results from Sampling activities conducted on December 17, 1987

WM JAN 13 1988

ORGANIC LABORATORY ANALYSIS REPORT

Field Log. No. —

Laboratory Sample No. 985MS Date Received: 12-22-87 Date Completed: 1-4-88

Sample Collected By: TPW/JDH Date Collected: 12-17-87

Sample Source & Identification: Athens Furniture Co.

Culvert on Matlock Rd CI-119

Analytical Procedures and Treatment of Sample:

20 mls OF SAMPLE WAS PLACED IN THE CELL OF A TEKMAR LIQUID SAMPLE CONCENTRATOR AND PURGED WITH He @ 40 ml/min FOR 15 minutes. THE TENAX TRAP WAS DESORBED @ 190°C BY INJECTION ONTO A 1% SP-1000, CARBOPACK "B" COLUMN OF A FINNIGAN 3200F GC/MS. THE OVEN TEMPERATURE WAS THEN PROGRAMMED FROM 30 TO 220°C @ 10°C/min.

Compound Requested or Analyzed for

| Compound | Results | Compound | Results | Compound | Results |
|---|---|---|---|---|---|
| 1. Toluene-C | | 8. | | 15. | |
| 2. Ethyl Benzene-C | | 9. | | 16. | |
| 3. Xylenes-C | | 10. | | 17. | |
| 4. Methyl Ethyl Ketone-C | | 11. | | 18. | |
| 5. | | 12. | | 19. | |
| 6. | | 13. | | 20. | |
| 7. | | 14. | | 21. | |

Remarks: C-confirmed

JAN 13 1988

# ORGANIC LABORATORY ANALYSIS REPORT

Field Log No. ——— Sampling Agency WM

Laboratory Sample No. Ø- 985 Date Collected 12-17-87 Date Received: 12-22-87

Sampled Collected By: TPW / JDH Date Completed 1-4-87

Sample Source & Identification: Athens Furniture Co.
Rag washwater + Boiler Blowdown Discharge @ Culvert
on Matlock Road CI-119
analyzed 12-29-87

## AROMATIC VOLATILE ORGANIC ANALYSIS

of 1/200 dilution

A 5 ML. SAMPLE FROM A SPECIALLY PREPARED VOA BOTTLE IS PURGED ONTO A TENAX TRA USING ULTRA HIGH PURITY HELIUM. THE TRAP IS THEN DESORBED TO A TRACOR 570 G.C AND ANALYZED USING A PHOTOIONIZATION DETECTOR.

| | |
|---|---|
| COLUMN: | 1% SP-1000/Carbopack B |
| STARTING TEMP: | 45°C |
| INITIAL HOLD: | 4 MIN. |
| PROGRAM RATE: | 8° PER MIN. |
| FINAL TEMP: | 200°C |
| FINAL HOLD: | 18 MIN. |

| COMPOUND | RESULTS (ppb) | COMPOUND | (RESULTS (ppb) |
|---|---|---|---|
| Benzene | ND | 1,3-Dichlorobenzene | ND |
| Toluene | 1460. | 1,2-Dichlorobenzene | ↓ |
| Chlorobenzene | ND | 1,4-Dichlorobenzene | ↓ |
| Ethyl Benzene | 5690. | Acetone | ↓ |
| m-Xylene | 16100. | Methyl Ethyl ketone | 796. |
| o-Xylene } reported together | 11700. | | |
| p-Xylene } | | | |
| Styrene | ND | | |

Remarks: ND - none detected

PH-239[illegible]
LAB 9/[illegible]
Form 2

# REPORT OF ANALYSIS

Environmental Laboratories | TN Department of Health & Environm

SOURCE Athens Furniture Co. MILE
IDENTIFICATION Rag Washwater & Boiler Blowdown Discharges @ Culvert on Matlock Rd.
Field Number ___ Collected by TPH/JDH Primary Station No ___ Date Collected 87-12-17
Time Collected 1610 Sample depth (ft) ___ Laboratory No CI-119
please check tests desired (x):

| Storet | X | Parameter | Unit | Result | Storet | X | Parameter | Unit | Result |
|---|---|---|---|---|---|---|---|---|---|
| 10 | X | Temperature | °C | 18 | 340 | X | COD (high) | mg/L | 8655 |
| 300 | X | Dissolved Oxygen | mg/L | 6.5 | 335 | | COD (low) | mg/L | |
| 310 | | BOD, 5-day, 20°C | mg/L | | 70508 | | Acidity, Total, hot | mg/L | |
| 403 | | pH, Lab | Units | | 412 | | Alkalinity, net | mg/L | |
| 400 | X | pH, field | Units | 12.0 | 38260 | X | MBAS | mg/L | ~~8~~ |
| 81 | | Color, apparent | CoU | | 95 | | Conductivity, 25°C | umho | |
| 80 | | Color, true | CoU | | 1105 | | Aluminum, Al | ug/L | |
| 70 | | Turbidity | NTU | | 1007 | | Barium, Ba | ug/L | |
| 410 | | Total Alk. as $CaCO_3$ | mg/L | | 1032 | | Chromium, hex., Cr | ug/L | |
| 415 | | Phth. Alk. as $CaCO_3$ | mg/L | | 1033 | | Chromium, tri., Cr | ug/L | |
| 437 | | Acidity as $CaCO_3$ | mg/L | | 1034 | | Chromium, total, Cr | ug/L | |
| 900 | | Hardness, total | mg/L | | 1037 | | Cobalt, Co | ug/L | |
| 910 | | Hardness, Calcium | mg/L | | 1147 | | Selenium, total, Se | ug/L | |
| 927 | | Magnesium, Mg | mg/L | | 1145 | | Selenium, diss., Se | ug/L | |
| 929 | | Sodium, Na | mg/L | | 1077 | | Silver, Ag | ug/L | |
| 937 | | Potassium, K | mg/L | | 32730 | | Phenols | ug/L | |
| 500 | | Total residue | mg/L | | 1022 | | Boron, total, B | ug/L | |
| 530 | X | Suspended residue | mg/L | 1280 | 615 | | Nitrate Nitrogen, N | mg/L | |
| 515 | | Dissolved residue | mg/L | | 620 | | Nitrite Nitrogen, N | mg/L | |
| 31501 | | Coliform, total | /100 ml | | 405 | | Free $CO_2$ | mg/L | |
| 31616 | | Coliform, fecal | /100 ml | | 505 | | Total vol. residue | mg/L | |
| 31679 | | Fecal Strep | /100 ml | | 535 | | Vol. susp. residue | mg/L | |
| 635 | | Total Kjl Nitrogen, N | mg/L | | 545 | | Settleable residue | mg/L | |
| 630 | | $NO_3$ + $NO_2$ as N | mg/L | | 666 | | Diss. Phosphate, P | mg/L | |
| 1097 | | Antimony, Sb | ug/L | | 745 | | Sulfide, total, S | mg/L | |
| 1045 | | Iron, Fe | ug/L | | 746 | | Sulfide, Dissolved, S | mg/L | |
| 1055 | | Manganese, Mn | ug/L | | 369 | | $Cl_2$, demand, 30 min | mg/L | |
| 940 | | Chloride, Cl | mg/L | | 50064 | | $Cl_2$, free residual | mg/L | |
| 950 | | Fluoride, F | mg/L | | 50060 | | $Cl_2$, combined res. | mg/L | |
| 665 | X | Total Phosphate, P | mg/L | 1.39 | 690 | | Total Carbon | mg/L | |
| 945 | | Sulfate, $SO_4$ | mg/L | | 550 | X | Oil & Grease | mg/L | 94 |
| 680 | | TOC | mg/L | | 720 | | Cyanide, Cn | mg/L | |
| 1067 | | Nickel, Ni | ug/L | | 32240 | | Tannin & Lignin | mg/L | |
| 71900 | | Mercury, Hg | ug/L | | 610 | X | Ammonia Nitrogen, N | mg/L | |
| 1051 | | Lead, Pb | ug/L | | 605 | | Organic Nitrogen, N | mg/L | 3.26 |
| 1042 | | Copper, Cu | ug/L | | 58 | | Flow Rate, CFM | | |
| 1002 | | Arsenic, As | ug/L | | 61 | | Flow rate, CFS, Inst. | | |
| 1027 | | Cadmium, Cd | ug/L | | 50 | | Flow rate, CFS, M.D. | | |
| 1092 | | Zinc, Zn | ug/L | | | | | | |
| 955 | | Silica, $SiO_2$ | mg/L | | | | Ignitability | °C | |
| | | | | | | X | Volatile Organic Analysis FID c | | |
| | | | | | | | Petroleum Products | | |
| | | | | | | | Organics | | |

Additional info: County ___

Lab Use Only:
Date Received ___ by ___ Date reported ___ by ___

Sampling Agency:
APC DRH OWM SWM
DWS WGW WPC DSM
OTHER ___

Sample type:
✓ WATER ___ AIR
___ TISSUE ___ SEDIMENT
OTHER ___

Priority:
___ EMERGENCY
✓ LEGAL
___ ROUTINE

Remarks: Acetone & MEK
** Received only holding time

## **Reference 8**

Site Photos - January 25-26, 2007

Site Name: Chattanooga Creek
Location: Chattanooga, Tennessee
DoR Personnel Present: C. Jackson , T. Keith

Site No. 33-688
Date: 01-25-2007
Prepared by: C. Jackson

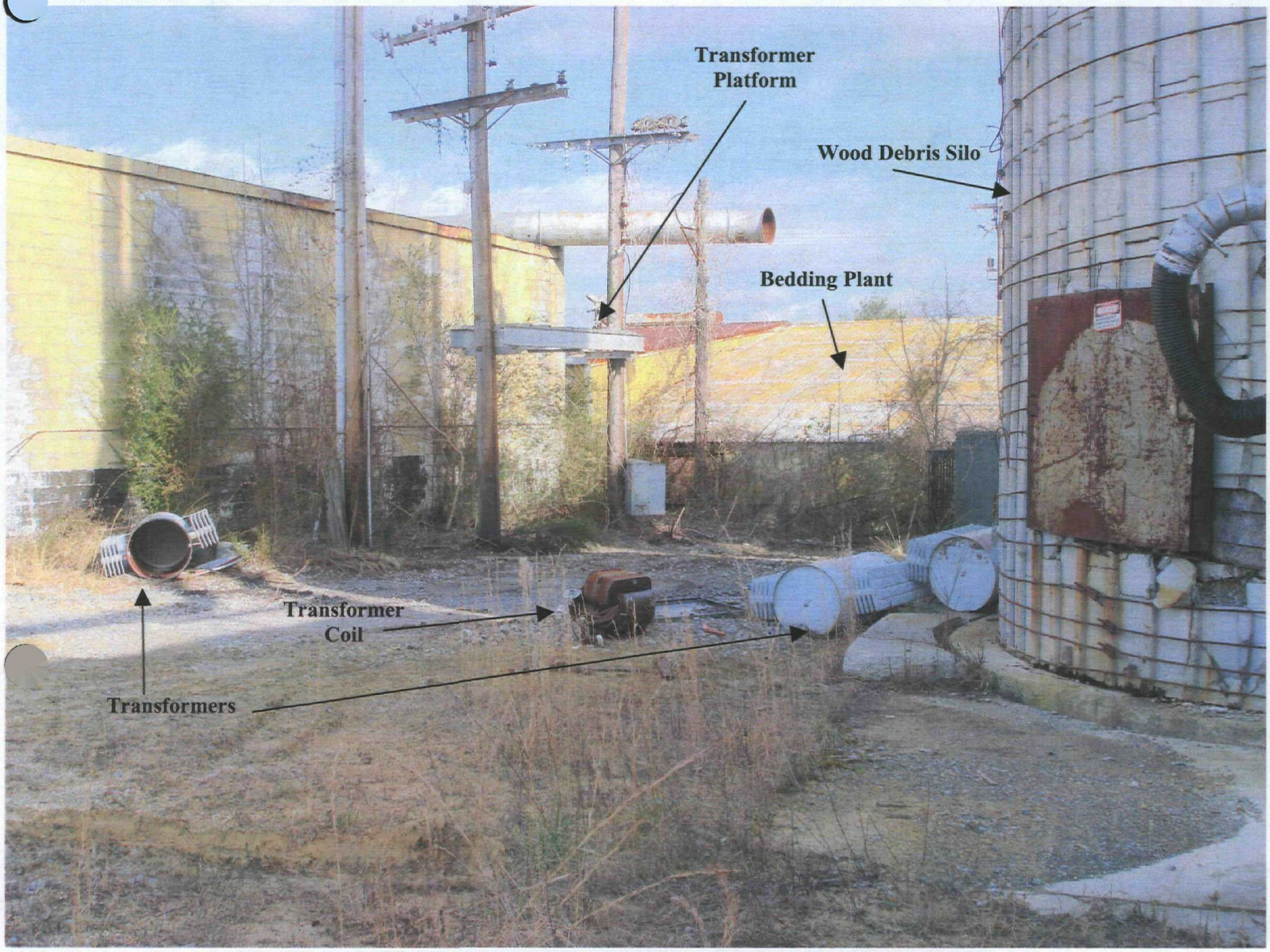



**Photo 1:** View facing east, the transformer platform and vandalized transformers, located near the wood debris silo and bedding manufacturing building.

Site Name: Athens Furniture Industries, Inc. | Site No. 33-688
Location: Athens, Tennessee | Date: 01-26-2007
DoR Personnel Present: C. Jackson | Prepared by: C. Jackson

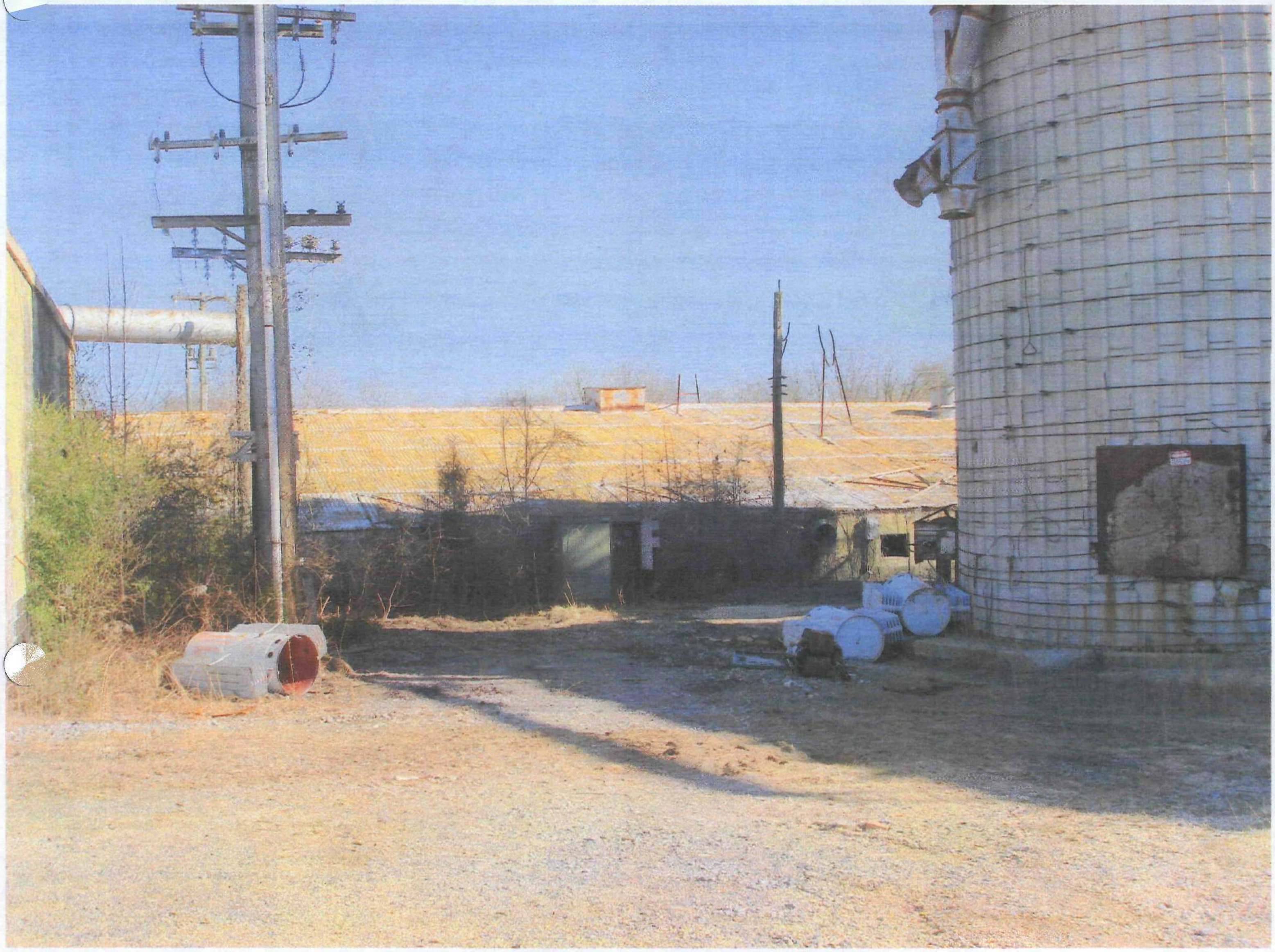


**Photo 2:** Same as above, one day later.

## Reference 9

Documentation provided by Larry Monteen from Athens Utility Board (AUB).

NON-PCB

## Transformer Location

| Town | Location | Station Number | W.O. | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | BED COMPANY | 333 | 50 583 01 | 9/7/1989 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values | Clear Default Values

Required (Link to GIS)

| | | | |
|---|---|---|---|
| Company # | 6004 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 120/240 |
| KVA | 333 | Phase | 1ph |
| Type | CONV | Impedance | 2.4 |
| Make | WESTINGHOUSE | Oil (gal.) | NA |
| Serial # | 83A060-426 | P.O. # | 10690 |
| Status | ACTIVE | Date Received | 5/31/1983 |

**TAPS / %**

**Above** 2 / 0 % **Below** 2 / 0 %

**Wt. (lbs)** 2556 **Cost** $3,118.00

## Transformer Location

| Town | Location | Station Number | W.O. # | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | BED COMPANY | 333 | 0-583-01 | 9/7/1989 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

*Required (Link to GIS)*

| | | | |
|---|---|---|---|
| Company # | 6005 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 120/240 |
| KVA | 333 | Phase | 1ph |
| Type | CONV | Impedance | 2.4 |
| Make | WESTINGHOUSE | Oil (gal.) | NA |
| Serial # | 83A061-756 | P.O. # | 10690 |
| Status | ACTIVE | Date Received | 5/31/1983 |

TAPS / %

Above 2 / 0 % Below 2 / 0 %

Wt. (lbs) 2556 Cost $3118.00

## Transformer Location

| Town | Location | Station Number | W.O. # | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | BED COMPANY | 333 | 0-583-01 | 9/7/1989 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

Required (Link to CIS)

| | | | |
|---|---|---|---|
| Company # | 6006 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 120/240 |
| KVA | 333 | Phase | 1ph |
| Type | CONV | Impedance | 2.4 |
| Make | WESTINGHOUSE | Oil (gal.) | NA |
| Serial # | 83A060-427 | P.O. # | 10690 |
| Status | ACTIVE | Date Received | 5/31/1983 |

TAPS / %

**Above** 2 / 0 % **Below** 2 / 0 %

**Wt. (lbs)** 2556 **Cost** $3,118.00

Platform station

**Transformer Location**

| Town | Location | Station Number | W.O. | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | ATHENS BED CO. OLD LEE HWY S | 2063 | 0-355-02 | 12/8/1972 | | |

Date Removed 12-15-06

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

*Required (Link to GIS)*

| | | | |
|---|---|---|---|
| **Company #** | 4192 | **Primary Volts** | 2400x7200 Dual |
| **Item #** | | **Secondary Volts** | 277/480Y |
| **KVA** | 333 | **Phase** | 3ph |
| **Type** | CONV | **Impedance** | 3.2 |
| **Make** | GE | **Oil (gal.)** | NA |
| **Serial #** | H359784P71AA | **P.O. #** | 6950 |
| **Status** | ACTIVE | **Date Received** | 6/12/1972 |

**TAPS / %**

**Above** 0 / 0 % **Below** 0 / 0 %

**Wt. (lbs)** 2090 **Cost** $1,513.00

## Transformer Location

| Town | Location | Station Number | W.O. # | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | ATHENS BED CO-OLD LEE HWY S. | 2063 | 0-355-02 | 12/8/1972 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

*Required (Link to GIS):*

| | | | |
|---|---|---|---|
| **Company #** | 4193 | **Primary Volts** | 2400x7200 Dual |
| **Item #** | | **Secondary Volts** | 277/480Y |
| **KVA** | 333 | **Phase** | 3ph |
| **Type** | CONV | **Impedance** | 3.2 |
| **Make** | GE | **Oil (gal.)** | NA |
| **Serial #** | H359251P71AA | **P.O. #** | 6950 |
| **Status** | ACTIVE | **Date Received** | 5/12/1972 |

**TAPS / %**

**Above** 0 / 0 % **Below** 0 / 0 %

**Wt. (lbs)** 2090 **Cost** $1,513.00

## Transformer Location

| Town | Location | Station Number | W.O. # | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | ATHENS BED CO. OLD LEE HWY S. | 2063 | 0-355-02 | 12/8/1972 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

*Required (Link to GIS)*

| | | | |
|---|---|---|---|
| **Company #** | 4194 | **Primary Volts** | 2400x7200 Dual |
| **Item #** | | **Secondary Volts** | 277/480Y |
| **KVA** | 333 | **Phase** | 3ph |
| **Type** | CONV | **Impedance** | 3.2 |
| **Make** | GE | **Oil (gal.)** | NA |
| **Serial #** | H359249P71AA | **P.O. #** | 6950 |
| **Status** | ACTIVE | **Date Received** | 6/12/1972 |

**TAPS / %**

**Above** 0 / 0 % **Below** 0 / 0 %

**Wt. (lbs)** 2090 **Cost** $1,513.00

## Transformer Location

| Town | Location | Station Number | W.O.# | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | INGLESIDE SCHOOL | 2586 | 0-728-01 | 5/5/1978 | 8/9/1990 | |
| ATH | BED CO. | 3064 | 0-584-01 | 8/19/1990 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

*Required (Link to GIS)*

| | | | |
|---|---|---|---|
| Company # | 5235 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 277/480Y |
| KVA | 500 | Phase | 3ph |
| Type | PAD | Impedance | 3.8 |
| Make | RTE | Oil (gal.) | NA |
| Serial # | 776004643 | P.O. # | 8676 |
| Status | ACTIVE | Date Received | 12/15/1977 |

TAPS / %

Above 2 / 2 % Below 2 / 2 %

Wt. (lbs) 5000 Cost $4,270.00

## Transformer Location

| Town | Location | Station Number | W.O.# | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | BED CO. | 3020 | 0-269-02 | 11/14/1983 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values | Clear Default Values

*Required (Link to GIS)*

| | | | |
|---|---|---|---|
| Company # | 5749 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 277/480Y |
| KVA | 750 | Phase | 3ph |
| Type | PAD | Impedance | 5.93 |
| Make | WESTINGHOUSE | Oil (gal.) | NA |
| Serial # | 81JD445-248 | P.O. # | 9809 |
| Status | ACTIVE | Date Received | 4/27/1981 |

TAPS / %

Above 2 / 0 % Below 2 / 0 %

Wt. (lbs) 7171 Cost $7,660.00

## Transformer Location

| Town | Location | Station Number | W.O. # | Install Date | Removal Date | Remarks |
|---|---|---|---|---|---|---|
| ATH | BED CO. | 2505 | 0-099-11 | 12/7/1977 | | |

# TRANSFORMER RECORD

Set Current Values as Default Values

Clear Default Values

Required (Link to GIS)

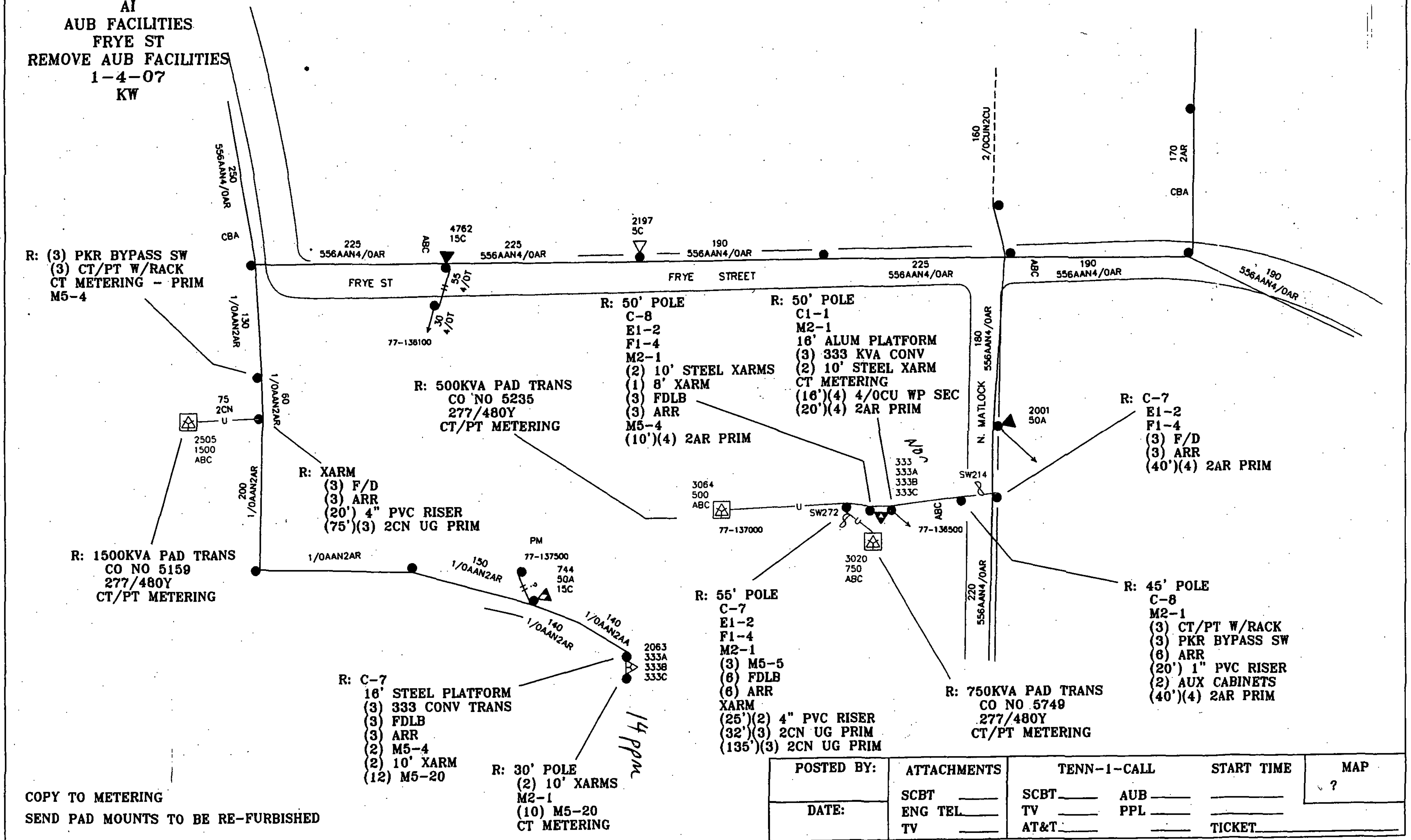
| | | | |
|---|---|---|---|
| Company # | 5159 | Primary Volts | 7200/12470Y |
| Item # | | Secondary Volts | 277/480Y |
| KVA | 1500 | Phase | 3ph |
| Type | PAD | Impedance | 5.83 |
| Make | WESTINGHOUSE | Oil (gal.) | NA |
| Serial # | TBT-1530-02 | P.O. # | 8649 |
| Status | ACTIVE | Date Received | 11/11/1977 |

TAPS / %

Above 2 / 0 % Below 2 / 0 %

Wt. (lbs) 9629 Cost $8,340.00

0-06-839
AI
AUB FACILITIES
FRYE ST
REMOVE AUB FACILITIES
1-4-07
KW




COPY TO METERING
SEND PAD MOUNTS TO BE RE-FURBISHED

| POSTED BY: | ATTACHMENTS | TENN-1-CALL | | START TIME | MAP |
|---|---|---|---|---|---|
| | SCBT ____ | SCBT ____ | AUB ____ | ____ | ? |
| DATE: | ENG TEL ____ | TV ____ | PPL ____ | ____ | |
| | TV ____ | AT&T ____ | ____ | TICKET ____ | |

## Appendix A

Tennessee Division of Superfund Chattanooga Environmental Assistance Center. *Preliminary Assessment Athens Furniture Industries, Inc.*, March 27, 2003

Ag ✓

DSF File #54519
CC CO - Sent via
NEF.

# PRELIMINARY ASSESSMENT
# ATHENS FURNITURE INDUSTRIES INC.
# MCMINN COUNTY, TENNESSEE
# TND000814525

March 27, 2003

TENNESSEE DEPARTMENT
OF
ENVIRONMENT AND CONSERVATION
DIVISION OF SUPERFUND

Prepared By

Angela Young
Environmental Specialist

Approved By

Nancy Frazier
Environmental Field Manager

March 24, 2003

**REPORT:** Preliminary Assessment
**Site:** Athens Furniture Industries Inc.
1241 Frye Street
Athens, McMinn County, TN 37303

**CERCLIS NO: TND000814525**
**TN DSF FILE NO: 54-519**

**Prepared by** Angela Young, Project Manager
Tennessee Division of Superfund

# 1. INTRODUCTION

## 1.1 Introduction

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments And Reauthorization Act of 1986 (SARA), The Tennessee Division of Superfund (TDSF) conducted a Preliminary Assessment (PA) at the Athens Furniture Industries Inc. site in McMinn County, Tennessee.

## 1.2 Objectives

The purpose of this investigation was to collect information concerning conditions a the Athens Furniture Industries Inc. site to confirm or deny any threat posed to human health and the environment and to determine if there is a need for additional action.

## 1.3 Scope of Work

The scope of the investigation consisted of the following:

- Review of the available file information within the Chattanooga, TN Department of Environment and Conservation Field Office.
- A comprehensive target survey. This consisted of reviewing the available information, in conjunction with offsite reconnaissance.
- Interviews with local agencies and utilities.
- Onsite reconnaissance of the facility.

## 2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

### 2.1 Location

The Athens Furniture Industries Inc. site is located at 1241 Frye Street in Athens, McMinn County, Tennessee (Figure 1). The site and surrounding area, within four miles, is depicted on the Athens 125-NE and the Riceville 125-NW topographic quads (Reference 1). The site coordinates were obtained using a hand held GPS unit during field reconnaissance. The centroid of the site was not accessible therefore the position, Latitude 35° 26' 31"N and Longitude 084° 33' 46" W, was taken at the southeast boundary of the property. (Reference 2). Directions to this site from Chattanooga, TN are as follows. Take I-75 N to the Athens Exit Exit 49 Athens/Decatur. Turn right on Highway 30 (David W. Lillard Memorial Parkway) and proceed to Old Riceville Road. Turn right on Old Riceville Road then left onto Maple Street. Frye Street will be on the left (Reference 1). The facility begins at the corner of Frye and Maple (Figure 2).

The climate of McMinn County is humid and mild. Temperatures are typically moderate, averaging 37.8° F in winter and 75.1° F in the summer. Total annual precipitation averages 57 inches. (Reference 3, pg. 14).

### 2.2 Site Description

Athens furniture Industries occupies approximately 27 acres of land in the city of Athens, McMinn County, Tennessee (Reference 4). The property is situated between to valleys, Dry Valley to the west and Oostanaula Valley to the southeast. In most areas, the difference in elevation between the valleys and the adjacent ridges is between 100 and 200 feet (Reference 3, page 13). The site contains several buildings that appear to be warehouses and other manufacturing areas.

The office and asphalt parking lot are located at the northeast corner and are separated from the other buildings by Matlock Avenue. The parcel is slightly higher in elevation on the southern boundary. The property is irregular in shape, and bordered on two sides by perimeter ditches. One ditch is approximately two feet deep and runs south between the office and manufacturing building. The remaining ditch is approximately 4 feet deep and parallels the Southern Railroad running east and west. The manufacturing side of facility is fenced except for the southeast boundary where a fire occurred in 2001. The manufacturing area contains no impervious surfaces other than the buildings. The yard of the facility is mostly covered by dirt and gravel. The western boundary is covered with grass and is adjacent to the Hammond Cemetery (Figure 2, Reference 2).

### 2.3 Operational History

The Athens Furniture Inc. property is located 1241 Frye Street and is owned by W.G. Clark and Alisha Clark since 2001 (Reference 4). The manufacturing facility was established in 1905 to manufacture furniture items (Reference 5). Other parties prior to the Clarks have owned the property. Previous owners include: New Athens, Inc. (1987) Athens Furniture Inc. (1982), Iva and Carl Lay (1978), Susan and Frank Carpenter, Athens Home Décor (1975), Royal Crown Cola Company (1972), Dorothy and Joseph Frye (1948) (Reference 4). No records could be located prior to 1980 that describe operations of the facility.

Two plants exist on the property at the corner of Matlock Road and Frye Street. The bed plant began operation in 1946 manufacturing solid hardwood bedroom furniture from start to finish beginning with uncut lumber, which was shaped, sanded and given a natural type finish. Stains and lacquers were applied using spray guns. The solvent blend used for all applications contained methyl ethyl ketone, toluene, methanol, and other alcohol's, and petroleum naphtha. When workers applied or changed stains, the spray guns were cleaned by dipping them into a bucket of lacquer thinner. Spray guns were also cleaned at the end of workday (Reference 6).

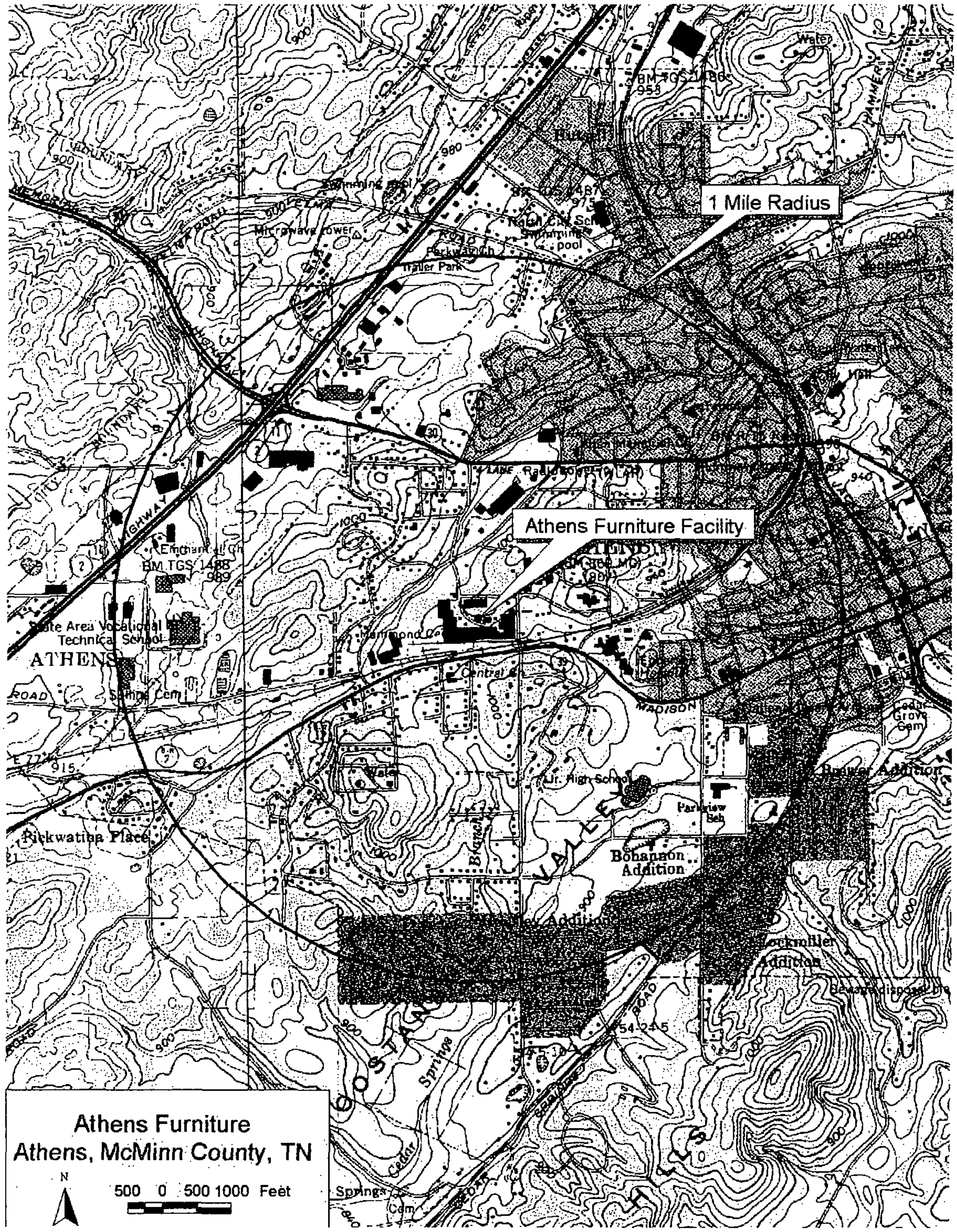



**Figure 1**
**Athens Furniture**
**DSF File No. 54-519**
**Athens quadrangle 125-NE**
**McMinn County, Athens Tennessee**
**7.5-minute series (topographic)**

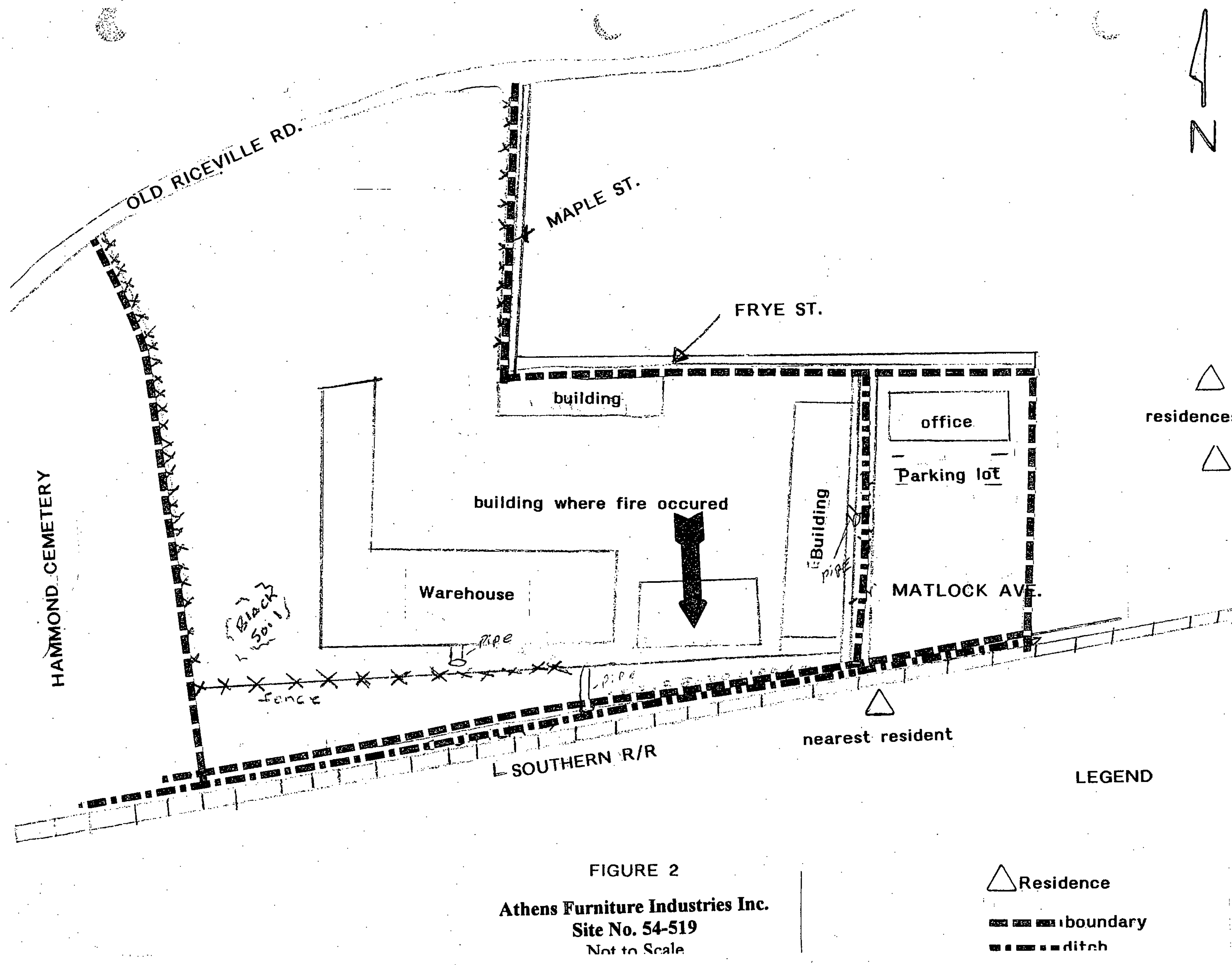



FIGURE 2

**Athens Furniture Industries Inc.**
**Site No. 54-519**
Not to Scale

The Dimension Plant began in 1978 and is adjacent to the Bed Plant. This plant manufactured wooden desks. Acetone was used to clean rollers that applied a base coat to desktops. Lacquer thinner was used to clean spray guns. Spent acetone and lacquer thinner were poured into 55 gallon drums. which accumulated outdoors at the rear of the plant, in an unknown location. The Dimension plant contained a boiler, which primarily burned wood trimmings and hazardous waste as fuel (Reference 6). The Dimension plant burned wood scraps too large for their baghouses in an outside pit (Reference 7).

A leak/spill of furniture sealant material was reported to The Division of Solid Waste Management on January 5, 1998. Division of Solid Waste Management records indicate the leak was in an underground transfer pipe near a concrete tile which allowed the material to flow to an open concrete ditch (approx. 210' long) running between two buildings. The material then entered an open dirt drainage area leading away from the building alongside a railroad track (Reference 8). DSWM file does not indicate which building is the Bed plant and which is the Dimension plant.

Athens Furniture was closed in 2001 due to bankruptcy (Reference 4).

## 3. GROUNDWATER PATHWAY

### 3.1 Geologic Setting

McMinn County is located within the Valley and Ridge physiographic province. Numerous northeast-southwest trending elongated valleys characterize the Valley and Ridge and ridges composed of Paleozoic carbonate and clastic rocks, predominantly limestone, dolomite, shale, and sandstone. Ridges are formed of resistant layers of sandstone or cherty soils, while the valleys are underlain by more erosion prone limestone, dolomite, and shale (Reference 3; 13). The rocks of the Valley and Ridge Province have been subjected to thrust faulting and are typically folded elongated anticlines and synclines resulting in moderate to steep angles of dip (Reference 9 pg. 49, 50).

Carbonate rocks such as limestone and dolomite tend to weather along planes of least resistance such as fractures, joints, and bedding planes. This type of weathering may cause the soil/bedrock contact to be pinnacled and /or slotted with more resistant beds of limestone protruding into the soils above. The limestone typically weathers to clastic, silty clays (Reference 9 pg. 90, 91).

The members of the Knox Group, beginning with the Chepultepec dolomite underlie the facility. The Chepultepec dolomite is fine to medium grained, light tan to gray, and is estimated to be 700 feet thick in the Cleveland area. Beneath the Chepultepec is the Copper Ridge dolomite (Reference 9 pg.11, 13,14). The Copper Ridge dolomite is estimated to be 1,000 feet thick in the Cleveland area and consists of dark crystalline, massive dolomite, which is commonly asphaltic. Underlying the Copper Ridge is the Conasauga Group. The Conasauga group, undivided, is composed of the Maynardville limestone at the top of the group, the Nolichucky shale in the middle, and the lower siltstone and shale sequence at the base (Reference 9 pg.11, 13,14).

The Maynardville limestone, which is approximately 350 feet thick, varies from massive blue argillaceous limestone in the lower part to a thin-bedded light gray dolomite in the upper part. The Nolichucky shale and underlying siltstone and shale sequence is estimated to be less than 1000 feet thick, but it is impossible to say for certain due to structural conditions and a lack of exposures. The Nolichucky shale, from top to bottom, consists of greenish-yellow clay shale approximately 100 feet thick, followed by a massive to thin-bedded blue argillaceous limestone of unknown thickness (Reference 9, pg. 16).

The primary pathway for groundwater flow would be expected to occur within secondary fractures and voids in the bedrock These pathways tend to decrease in size and abundance with increase in depth

(Reference 11 pg. 19-21). These formations have considerable amounts of sand in the bedrock, as well as an appreciable content of iron. Tellico, Steekee, and Red Hills soils are predominant in the uplands. Alcoa soils are on the stream terraces and foot slopes in the area. Neubert soils are on flood plains (Reference 3, pg. 13).

### 3.2 Ground Water Targets

The Athens Utilities Board serves most residents from New Spring and three groundwater wells blended into Ingleside Spring. The municipal groundwater wells, New Spring, and Ingleside Spring are located approximately 2 miles northeast of the Athens Furniture Inc. site. Athens Utilities Board serves 17,037 customers with a maximum daily pumping rate of 2.084 million gallons (Reference 10). Athens Furniture had a groundwater well on site prior to 1970, which was used for industrial purposes (Reference 11). Athens Utility Board confirmed that there are several private wells within 0.5 miles of the site (Reference12). Evaluation of the 2000 census data for McMinn County indicates an average household population of 2.5 persons (Reference 17 pg. 1). This data along with information provided from the utility indicates the potential of 40 people using groundwater within the 0.25 and 0.50-mile radii.

### 3.3 Ground Water Conclusions

Groundwater pathways are considered to be a threat due to the proximity of private drinking water wells to the site, the existence of Karst terrain underlying the site, the operational history of Athens Furniture Inc, and the nature of volatile substances.

## 4. SURFACE WATER PATHWAY

### 4.1 Hydrologic Setting

Field reconnaissance indicates that overland drainage from the site appears to flow south and southeast from several points and enters dirt ditches along parcel boundary (Reference 2). Once entering these ditches, Athens Utilities Board assumes the ditches enter the City of Athens storm sewer system. The probable point of entry (PPE) is considered to be where the storm sewer system discharges into Oostanaula Creek located at the intersection of N. Jackson Street and Green Street approximately one mile from site (Reference 12). However, several ditches and drainage areas were observed that did not appear to intersect with storm drains (Reference 2).

Once drainage reaches Oostanaula Creek, the surface water body flows in a south to southwest pattern the remaining 15 miles of the surface water pathway in this creek. A permit filed with TNWPC lists Oostanaula Creek as the receiving water body (Reference 13). The average flow rate for Oostanaula Creek is 1-12 cubic feet per second (Reference 12). The facility is outside of the 500-year flood zone (Reference 14).

### 4.2 Surface Water Targets

There are no drinking water intakes located within 15 downstream miles of the site (Figure 3). Oostanaula Creek is used as a backup water supply for the Athens Utility Board, Athens. The intake is located approximately 2 miles upstream of site. (Reference 10).

Wetlands are located along the 15-mile surface water pathway on sides of Oostanaula Creek for 9.1 miles. There is no recreational fishing along Oostanaula Creek (Reference 13).

### 4.3 Surface Water Conclusions

This pathway is considered to be a threat for the known spill of 1000 gallons of furniture sealant material, which is assumed to have entered Oostanaula Creek.

## 5. SOIL EXPOSURE AND AIR PATHWAY

### 5.1 Physical Conditions

The approximate 27-acre site is covered by 70 percent buildings and asphalt, 10 percent soil and gravel, 10 percent wooded, and 10 percent grass coverage around perimeter of site and on the eastern boundary. Currently the site appears abandoned and partially demolished due to a fire that occurred on July 29, 2002 (Reference 15). The property surrounding the facility is industrial, with the exception of residential areas west and south of the property and a cemetery on the western boundary. The facility is partially fenced and is bordered by a gravel access road and Southern Railroad easement. The site is easily accessible from the southern boundary where the fire originated. A second fire occurred at the site on November 12, 2002. This fire was an open fire and was reported after TDSF initial site discovery (Reference 15) Field reconnaissance revealed soil staining on the west side of site nearest the Hammond Cemetery (Reference 2).

### 5.2 Soil and Air Targets

Currently, the facility appears to be vacant and partially fenced. (Reference 2). Tennessee Air Pollution Control files indicate a wood scrap burn area was located on the site (Reference 7). Residential areas are located adjacent and within 200 feet of the facility (Reference 1). There is also the possibility that sensitive environments for the Swainsons Warbler exist near the site (Reference 18).

### 5.3 Soil Exposure and Air Pathway Conclusions

Soil Exposure pathways present concern due to the unfenced southern boundary, and the proximity of residences adjacent to the site. The facility is not in operation so there is not a concern of air release.

## 6. Summary and Conclusion

Athens furniture Industries occupies approximately 27 acres of land in the city of Athens, McMinn County, Tennessee. The manufacturing facility was established in 1905 to manufacture furniture items. Stains and lacquers were applied using spray guns. The solvent blend used for all applications contained methyl ethyl ketone, toluene, methanol, and other alcohol's, and petroleum naphtha.

Based on the current conditions from the site, it is possible that threats exist to human health or the environment. This conclusion applies to three of the four pathways and is supported by documentation from other regulatory divisions and field reconnaissance. Further assessment is needed.

Site Name: Athens Furniture
Location: Athens, McMinn County, Tennessee
DSF Personnel Present: Andy Carroll & Angela Young
Photo taken by: A. Carroll

Site No. 54-000
Date: 10-14-02
Time: 1400
Document prepared by: [signature]

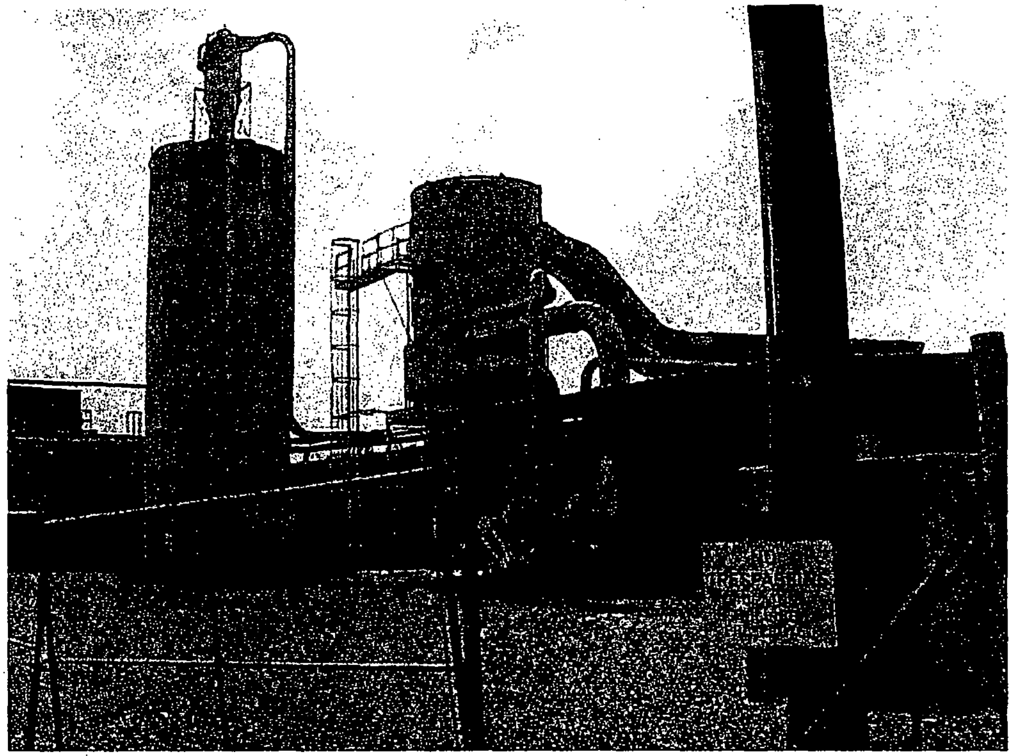


**Photo 1:** View of vacant, former Athens Furniture facility as seen from main gate off of access road from Old Riceville Rd. Photo taken facing east.

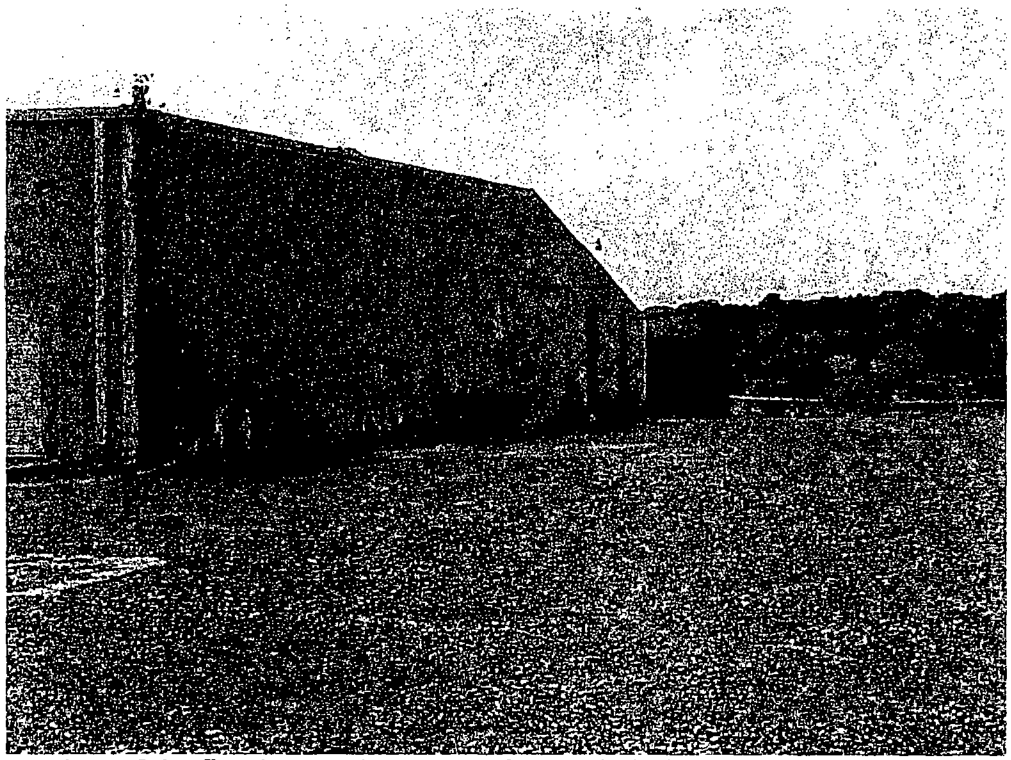


**Photo 2**: View of the fire damage in western facility building. Photo taken facing SW.

Site Name: Athens Furniture
Location: Athens, McMinn County, Tennessee
DSF Personnel Present: Andy Carroll & Angela Young
Photo taken by: A. Carroll

Site No. 54-000
Date: 10-14-02
Time: 1400
Document prepared by: Andy C

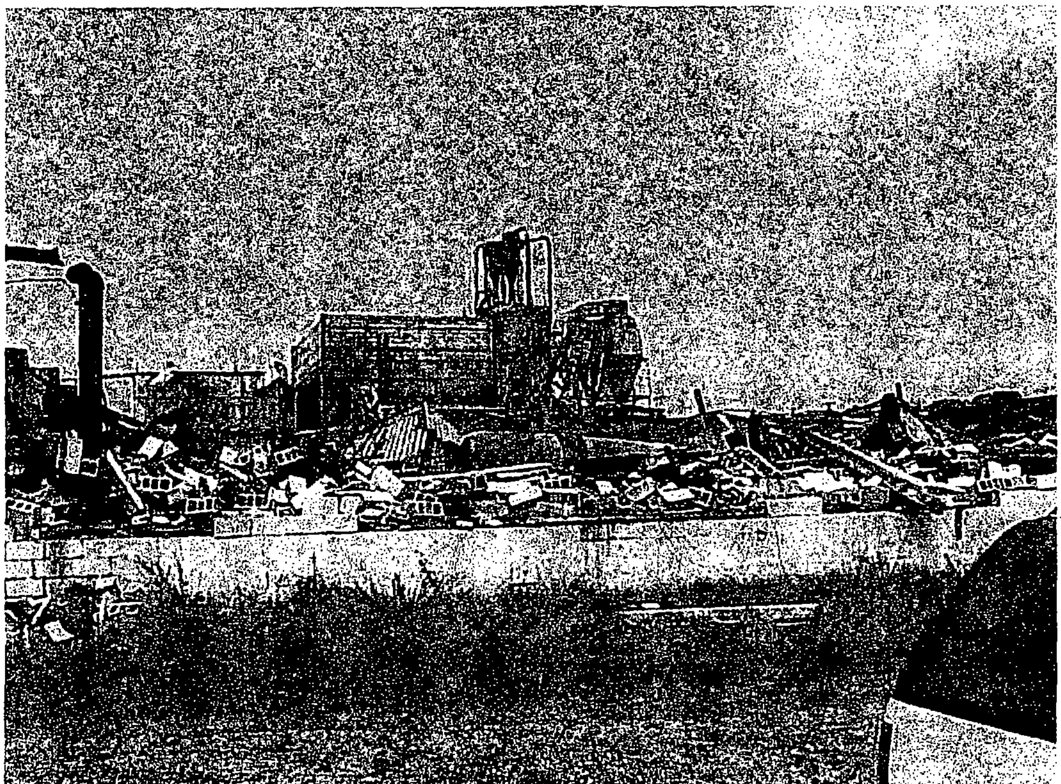


**Photo 3**: View of partially collapsed and demolished facility on the ~~3rd~~ Southern boundary of property. Photo taken facing west.

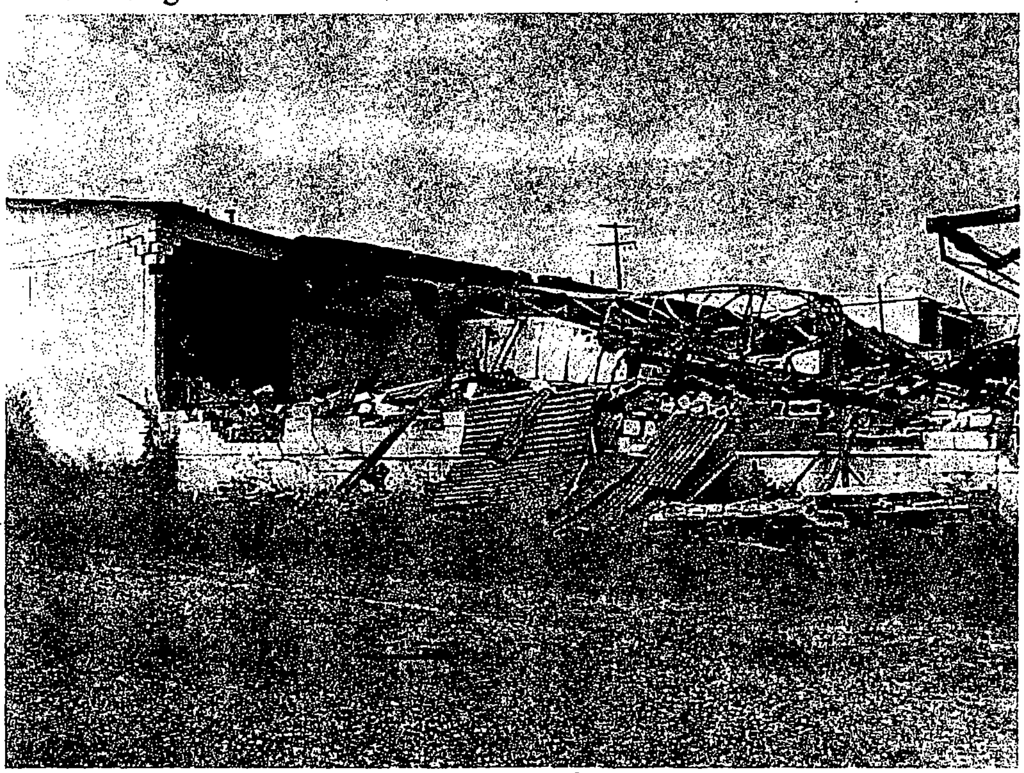


Photo 4: View of partially collapsed/demolished facility structure. View taken facing NW Amd 3/03

**Site Name: Athens Furniture**
**Location: Athens, McMinn County, Tennessee**
**DSF Personnel Present: Andy Carroll & Angela Young**
**Photo taken by: A. Carroll**

**Site No. 54-000**
**Date: 10-14-02**
**Time: 1400**
**Document prepared by:** Andy C

Photo 5: View of access road on Southern property boundary. Note abandoned facility structure on left and residence on right. A rail line borders the access road on the right. Photo taken facing East. AMT 3/03

Site: Athens Furniture
Location: Athens, McMinn County, Tennessee
DSF Personnel Present: A. Young, A. Carroll
Photo taken by: A. Carroll

Site # 54-519
Date: 1-23-03
Time: 10:30 a.m.
Document prepared by: Angela Young

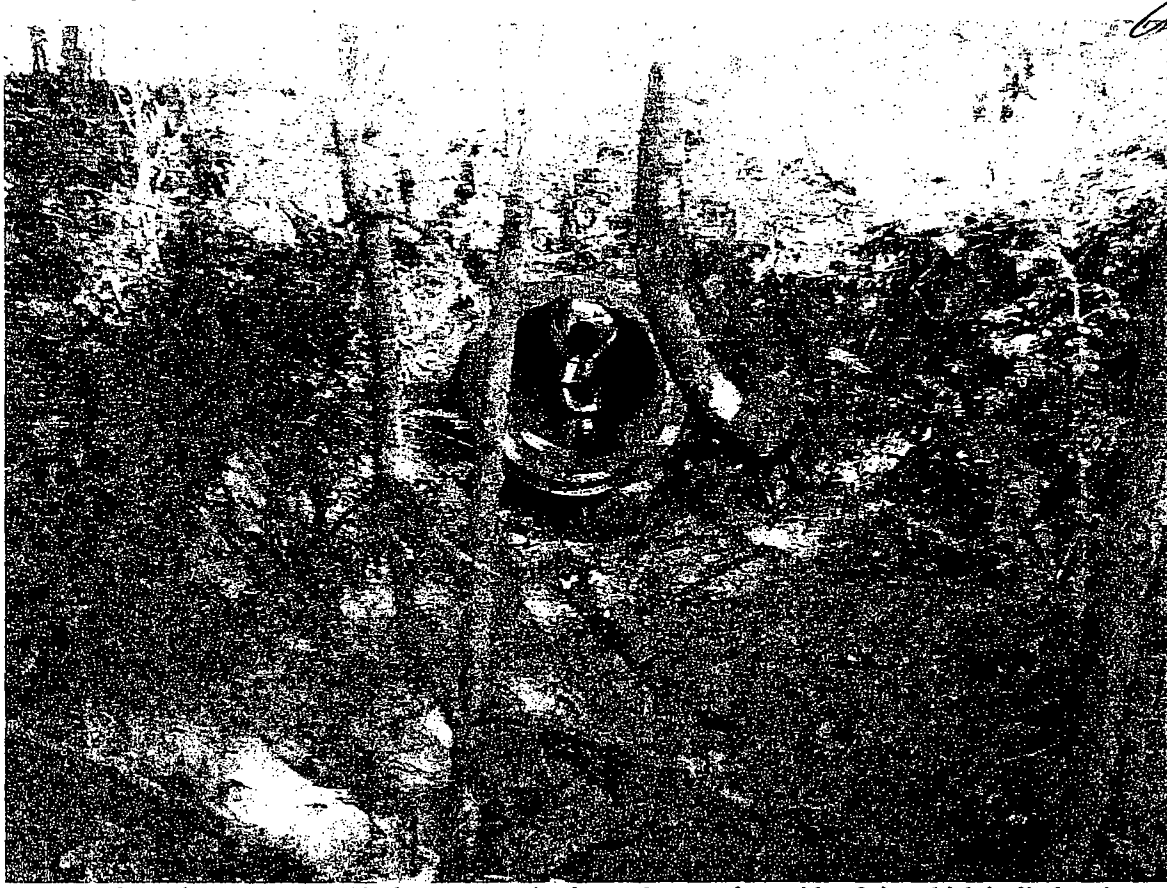


Photo 1: Photo shows approx. 18inch Concrete pipe located on southern side of site which is discharging into a ditch on r/r easement. Note the Approx. 6inch PVC pipe inside the concrete pipe.

Site: Athens Furniture
Location: Athens, McMinn County, Tennessee
DSF Personnel Present: A. Young, A. Carroll
Photo taken by: A. Carroll

Site # 54-519
Date: 1-23-03
Time: 1030
Document prepared by: Angela Young

Angela Young

Photo 2: Corrugated metal pipe located on south side of building near cemetery. Photo taken along fence line of Athens furniture and Cemetery. Photo taken facing north.

**Site: Athens Furniture**
**Location: Athens, McMinn County, Tennessee**
**DSF Personnel Present: A. Young, A. Carroll**
**Photo taken by: A. Carroll**

**Site # 54-519**
**Date: 1-23-03**
**Time: 1100**
**Document prepared by: Angela Young**

Angela Young

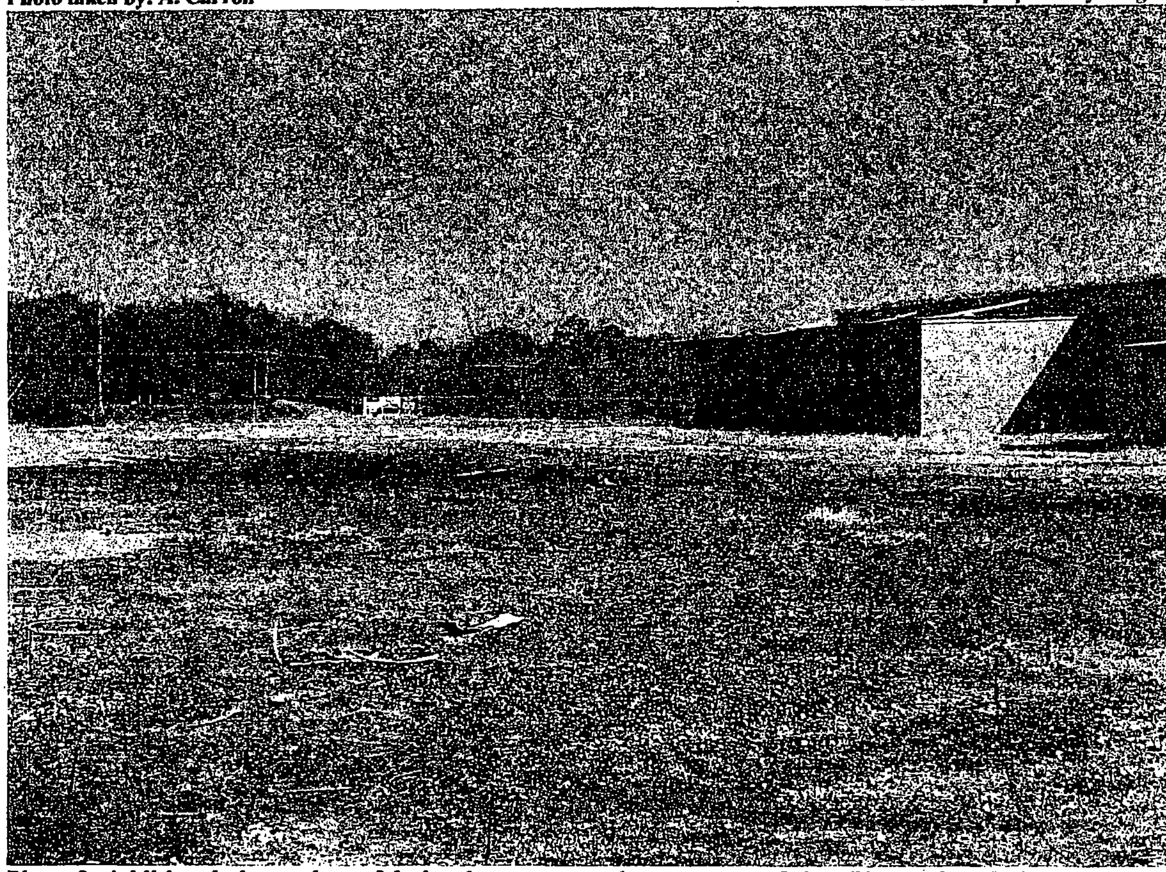


Photo 3: Additional photo taken of dark substance a south east corner of site. Photo taken facing north west towards Old Riceville Rd.

Site: *Athens Furniture*
Location: Athens, McMinn County, Tennessee
*DSF Personnel Present:* A. Young, A. Carroll
Photo taken by: A. Carroll

Site # 54-519
Date: 1-23-03
*Time: 1100*
Document prepared by: Angela Young

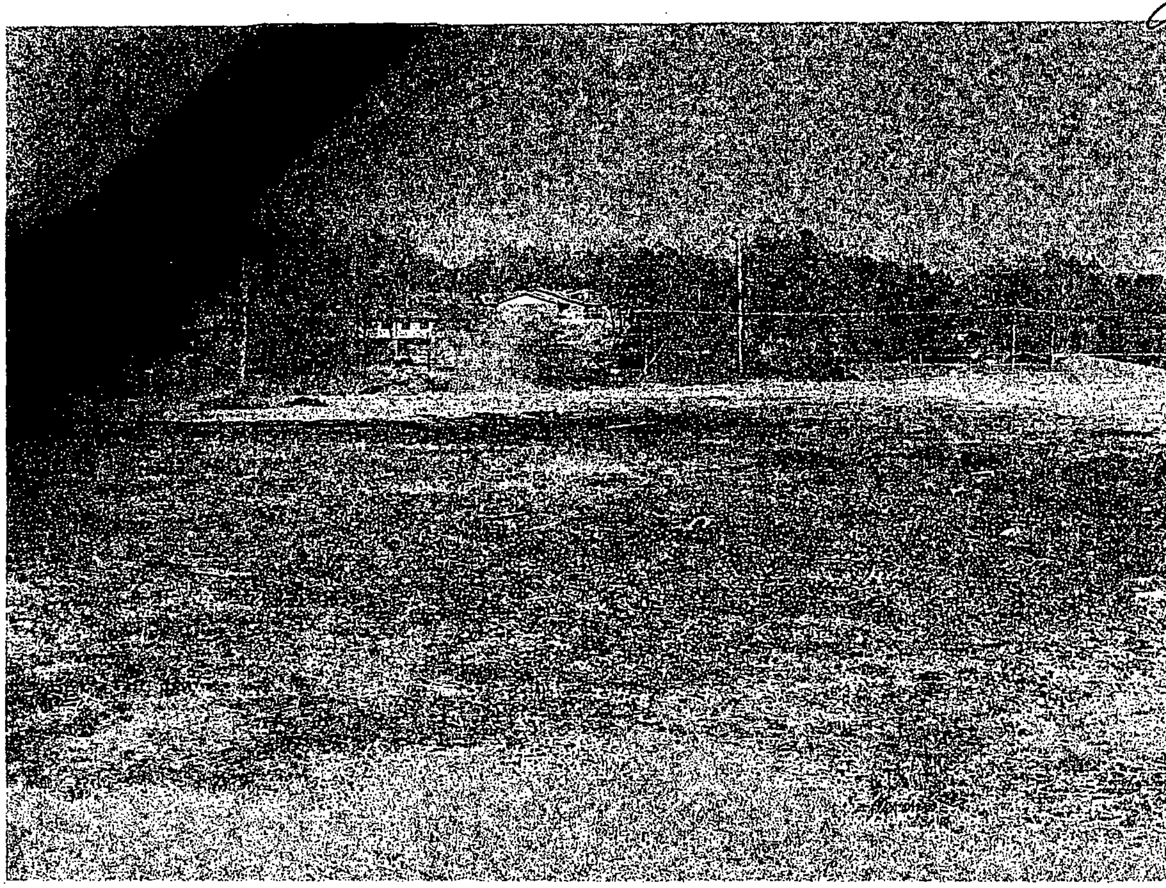


Photo4: Additional Photo taken of darkened soil found on the southeast corner of site near cemetery and Old Ricevill

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18. Tennessee Department of Environment and Conservation. Division of Natural Heritage. Rare species of McMinn County. July 25, 2002.

# Reference 3

**U. S Department of Agriculture**
**Tennessee Agricultural Experiment Station**
**Tennessee Department of Agriculture**
**McMinn Board of County Commissioners**

Soil Survey, McMinn County, Tennessee, 1997

United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the Tennessee Agricultural Experiment Station, the Tennessee Department of Agriculture, and the McMinn County Board of Commissioners

# Soil Survey of McMinn County, Tennessee

Detailed maps are available in two formats. Digital copies (SSURGO) that can be used in a Geographic Information System (GIS) can be accessed at http://www.ftw.nrcs.usda.gov/ssur_data.html. (The State Soil Survey Area ID is TN107). Paper copies of the maps can be obtained from the USDA Service Center, Athens Field Office/McMinn County Soil Conservation District, 320 North Congress Parkway, Suite C, P.O. Box 524, Athens, TN 37303 (telephone number 423-745-6300, ext. 3).

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1996. This survey was made cooperatively by the Natural Resources Conservation Service, the Tennessee Agricultural Experiment Station, the Tennessee Department of Agriculture, and the McMinn County Board of Commissioners. The survey is part of the technical assistance furnished to the McMinn County Soil Conservation District.



**Cover: A Jersey dairy herd in an area of Waynesboro clay loam, 5 to 12 percent slopes, eroded. The corn and grass strips in the background are in areas of Dewey silty clay loam, 5 to 12 percent slopes, eroded, on the ridge and Etowah loam, 2 to 5 percent slopes, on the footslopes.**

*Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov.*

# Soil Survey of McMinn County, Tennessee

By Richard L. Livingston and Melissa C. Oliver, Natural Resources Conservation Service

Fieldwork by Melissa C. Oliver and Richard L. Livingston, Natural Resources Conservation Service, and Billy R. Roach, McMinn County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Tennessee Agricultural Experiment Station, the Tennessee Department of Agriculture, and the McMinn County Board of Commissioners

McMinn County is in the southeastern part of Tennessee (fig. 1). It is about 139 miles from Nashville, 54 miles from Knoxville, and 50 miles from Chattanooga. It is bordered on the north by Loudon and Roane Counties, on the south by Bradley and Polk Counties, on the west by Meigs County, and on the east by Monroe County. The Hiwassee River forms part of the southern border. Athens, the county seat, is near the geographic center of the county. Etowah, Englewood, Niota, Calhoun, and Riceville are other towns in the county. According to census data, the county had a population of 45,001 in 1995.

The county is roughly triangular in shape and has an area of 276,700 acres, or about 432 square miles, of which 2,300 acres is water. The U.S. Department of Agriculture, Forest Service, owns about 2,200 acres in the county.

This soil survey updates the survey of McMinn County, Tennessee, published in 1957 (Bacon and others 1957). It provides additional information about the soils and has maps that have a photographic background.

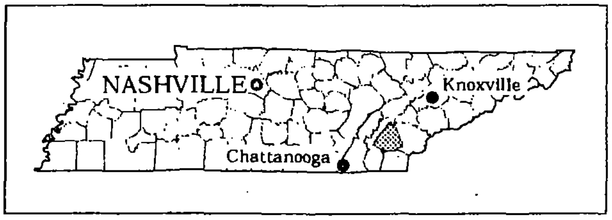



**Figure 1.—Location of McMinn County in Tennessee.**

## General Nature of the County

This section gives general information about the county. It describes history and settlement; transportation and industry; natural resources; physiography, drainage, and geology; and climate.

### History and Settlement

McMinn County was formed from a part of the Hiwassee District owned by the Cherokee Indians. The land was ceded to the United States by a treaty that was signed at Washington, D.C., on February 27, 1819. Under terms of the treaty, those individuals who chose to become citizens of the United States were given a reservation of 640 acres. Very few individuals accepted the offer. A grant of 640 acres also was made to a few other individuals who were deemed capable of managing their own affairs. These grants soon passed into the hands of land speculators (History of Tennessee 1887).

On November 13, 1819, the Legislature at Murfreesboro, Tennessee, passed an act to organize McMinn County. County court was organized on

March 6, 1820, in the home of John Walker at Calhoun. Justices present were George Colville, John Walker, Benjamin Griffith, Samuel Dickey, Hambright Black, Archibald Black, and Jacob Sharp (History of Tennessee 1887). Judge Charles Fleming Keith organized the first circuit court in the spring of 1820 at Calhoun (Byrum 1984). Court was temporarily held in a log structure erected in Calhoun before it was transferred to Athens in December 1923 (History of Tennessee 1887).

The county was named in honor of Joseph McMinn, who was born in Pennsylvania in 1758 and migrated to the east Tennessee area in about 1775. He was active in the 1796 Knoxville Convention, which drafted the first Tennessee State constitution. McMinn insisted on the inclusion of a "bill of rights" for the constitution. Later, he personally carried the State constitution to George Washington. McMinn was elected governor of Tennessee in 1815, 1817, and 1819 (Byrum 1984). At the time of his death, Gov. McMinn was in charge of the Cherokee Agency across the Hiwassee River. His body is buried in the yard adjoining the Presbyterian Church in Calhoun (History of Tennessee 1887).

Transportation played a big role in the location of towns and villages in the county. Many of the towns were established along the Hiwassee River or, in later years, along railroad lines.

Calhoun, which is on the banks of the Hiwassee River, was the first town established in the county. It was laid out by Major John Walker and named in honor of John C. Calhoun.

The need for a more central location for the county seat prompted the establishment of Athens. The town was laid out in 1821–22 on land donated by William Lowry. Courts were moved to Athens in December 1823, and the seat of justice was formally established by the State Legislature in 1824. The act for organizing a chancery court at Athens was passed on January 30, 1844. In 1887, the population of Athens was estimated at 1,500 and the town was said to be one of the most prosperous in east Tennessee.

Riceville had its beginning in 1855 on a block of land that C.N. Rice bought from Native Americans. The town was established soon after railroad construction reached the area.

Niota was formerly known as Mouse Creek. J.H. Gill, who opened the first store in the town, built the first house in 1855. Upon completion of the railroad, the citizens of the community erected a large railroad depot.

In 1870, Englewood began as an industrial community that was started by three brothers—James, Mortimer, and Jacob Brient. It was built along the banks of Chestuee Creek, about 2 miles south of the present town of Englewood. In 1907, the cotton mill was moved to a location near Tellico Junction, where a small community had sprung up near the railroad junction. The name of Tellico Junction was changed to Englewood in 1908.

Etowah was founded in 1907. L&N Railroad later bought 1,500 acres of farmland from Joseph Cobb, James L. Cooper, William Paris, and William T. Peck in order to locate a rail yard and service center in the town. Etowah was chartered in 1909.

In 1950, the population of Athens was 8,618 and the population of the county was 32,024. By 1990, the population of Athens had reached 12,573 and the county population had increased to 43,552.

## Transportation and Industry

McMinn County has an excellent network of highways and roads, almost all with some type of bituminous surface. Interstate Highway 75 bisects the county northeast to southwest. U.S. Highway 11 runs roughly parallel to I–75, and U.S. Highway 411 crosses the eastern part of the county in a similar fashion. The major State highways are 68 and 30. State Highway 68 runs east-west across the northern tip of the county, and State Highway 30 begins in Etowah and runs roughly from the southeast to the northwest across the county. Numerous secondary State highways and county roads supplement the main arteries.

Two railroads and numerous motor freight companies serve businesses in the county. One port facility is available on the Hiwassee River near Calhoun. Commercial air service is available in Knoxville and Chattanooga. The McMinn County Airport is also available for smaller planes and private transportation.

Industrial enterprises include manufacturers of textile products, automotive parts, electrical appliances and parts, wood products, furniture, chemicals, plastic products, metal and aluminum fabricated products, dairy products, newsprint, and farm implements. Farming and the wood industry are also important enterprises in the county.

## Natural Resources

Soils, water, minerals, and forestland are important natural resources of McMinn County. There is an abundant supply of fresh water. Year-round streams are common. The main streams that drain the county are Rogers, Spring, Oostanaula, Chestuee, and Conasauga Creeks. On the southern border, the Hiwassee River is part of the tailwaters of

Chickamauga Lake. Springs, small streams, ponds, and wells are numerous in the county. They furnish water for domestic use and for livestock. About half of the county has a State-approved public water supply.

Important mineral resources of the county are mainly limestone and barite. Limestone for construction materials and roads is produced from one active quarry in the county. Several small abandoned quarries are indicated by a special symbol on the detailed soil maps. Barite (barium sulfate) is mined in the northern part of the county. Most of the barite mines are now abandoned.

About 136,500 acres of McMinn County is forested. About 2,200 acres of this land is in Cherokee National Forest. Pulpwood and hardwood production are important industries in the county.

## Physiography, Drainage, and Geology

B.A. Hartman, geologist, Natural Resources Conservation Service, helped prepare this section.

Topography in the county varies. The highest point in the county is on Starr Mountain, in the eastern part of the county. It is about 2,300 feet above mean sea level (m.s.l.). The lowest point is in the southwestern part of the county, near the Hiwassee River and Chickamauga Lake. It is about 690 feet above m.s.l. Elevation in the rest of the county ranges from 800 to 1,100 feet above m.s.l. In most areas, the difference in elevation between the valleys and the adjacent ridges is between 100 and 200 feet. Athens, the county seat, is about 880 feet above m.s.l.

McMinn County lies in two major land resource areas—the Southern Appalachian Ridges and Valleys and the Blue Ridge (USDA 1981). Differences in topography can be partly attributed to differential weathering (ease or resistance to weathering) of the underlying bedrock. Shale, limestone, and dolomite weather at a faster rate than sandstone, quartzite, and calcareous (limestone/dolomite) bedrock having a large content of chert or silica cementation. Intense folding and faulting of the rocks also influenced the weathering characteristics and played a large part in the development of the topography in the county.

The Southern Appalachian Ridges and Valleys region is characterized by a series of northeast-southwest oriented ridges and valleys that formed during the late Protozoic mountain building episode that formed the Appalachians. In the central part of the county, cherty dolomite and limestone of Ordovician age form the ridges. Copper Ridge Dolomite, Chepultepec Dolomite, and Longview Dolomite are the principal ridge formers. Bodine, Fullerton, and Dewey soils are common on these geologic formations. The less cherty Kingsport Formation and Mascot Dolomite are generally at the lower elevations (USGS 1952a, 1952b). Dewey and Fullerton soils predominate these areas. Most of the valleys in the central portion of the region are underlain by Cambrian-age Conasauga Shale (USGS 1952a, 1952b). This acid shale bedrock is parent material for the Coile, Townley, Apison, and Corryton series. Some areas of Conasauga Shale, Mascot Dolomite, and the Kingsport Formation are capped with material that was deposited by ancient streams, probably during the Pleistocene epoch. Waynesboro, Etowah, and Tasso soils and the upper part of the Dewey soils formed in these deposits. Younger alluvium on the flood plains was deposited during the Holocene epoch. Hamblen, Steadman, Pettyjon, Rockdell, and Bloomingdale soils are dominant on flood plains in this area.

The Ordovician-age Ottosee Shale and Athens Shale are exposed in a northeast-southwest oriented area that is southeast of Athens, in part of the Oostanaula Creek drainage area. These formations are also exposed near the base of the Red Hills area north of Etowah. Ottosee Shale and Athens Shale are the parent materials for the Nonaburg and Needmore soils. The Red Hills area is highly dissected and has dark red soils. The Ordovician-age Holston and Lenoir Limestones underlie two ridges in the central part of the county and a pronounced lobe north of Etowah. These formations have considerable amounts of sand in the bedrock, as well as an appreciable content of iron. Tellico, Steekee, and Red Hills soils are predominant in the uplands. Alcoa soils are on stream terraces and footslopes in the area. Neubert soils are on flood plains.

In the western part of the county, an area of highly dissected topography is underlain by the Cambrian-age Rome Formation (USGS and Tennessee Division of Geology 1953). This parent material is a heterogeneous mixture of yellow, brown, red, purple, and green siltstone, sandstone, and shale with a few thin layers of limestone or dolomite. Sunlight and Apison soils are common in the uplands. Very few stream terrace deposits are in this area. Hamblen soils are common on narrow flood plains.

The Blue Ridge land resource region is in the extreme eastern part of the county, on Starr Mountain. The Cambrian-age Nebo Sandstone, Nichols Shale, and Cochran Conglomerate underlie most of the area. The Precambrian-age Sandsuck Shale is exposed in a few areas at the base of the mountain (USGS and Tennessee Division of Geology 1953). McCamy and Unicoi soils are the predominant soils formed in areas of arkosic sandstone bedrock. Cataska and Harmiller soils are the predominant soils formed in areas of shale bedrock. Lostcove and Keener soils are on the lower mountainsides and base slopes. They formed in bouldery and cobbly material that was moved down the mountain slope by gravity and water. Atkins and Arkaqua soils are on the flood plain along Bullet Creek.

Table 19 gives additional information about the relationships between soils, parent materials, and geology of the survey area.

### Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Athens, Tennessee, in the period 1962 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 37.8 degrees F and the average daily minimum temperature is 26.4 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -16 degrees. In summer, the average temperature is 75.1 degrees and the average daily maximum temperature is 87.2 degrees. The highest recorded temperature, which occurred on July 17, 1980, is 105 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 57 inches. Of this, about 30 inches, or 53 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.46 inches on March 16, 1973. Thunderstorms occur on about 56 days each year, and most occur in summer.

The average seasonal snowfall is about 6.3 inches. The greatest snow depth at any one time during the period of record was 14 inches. On the average, 3 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 56 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 64 percent of the time possible in summer and 46 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 8 miles per hour, in March.

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in some adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

## Survey Procedures

The general procedures followed in making this survey are described in the "National Soil Survey Handbook" of the Natural Resources Conservation Service and the "Soil Survey Manual" (Soil Survey Staff 1996; Soil Survey Division Staff 1993). The soil survey of McMinn County published in 1957 (Bacon and others 1957), the "Geologic Map of East Tennessee with Explanatory Text" (USGS and Tennessee Division of Geology 1953), and other soil surveys of areas in the Ridges and Valleys and Blue Ridge provinces were among the references used.

Before fieldwork began, boundaries of slopes and landforms were plotted on United States Geological Survey (USGS) 7.5-minute topographic maps at a scale of 1:24,000. Maps from the 1957 soil survey were reduced from a scale of 1:15,840 to a scale of 1:24,000 to aid in transferring the boundaries. These boundaries and soil descriptions were used as a reference to plan soil observations and complete transects. Soil examinations were completed with the aid of a hand auger or spade or a hydraulic soil probe to a depth of 4 to 6 feet or to bedrock, whichever was shallower. After summarization of transects, the older soil series and map units were combined or reclassified, or both, according to the eighth edition of "Keys to Soil Taxonomy" (Soil Survey Staff 1998). Some soil series were dropped from the legend because of updates in soil classification. The 1938 United States Department of Agriculture Handbook, "Soils and Men," was the classification resource used for the 1957 survey. Five soil series were established to fill in gaps caused by the classification conversion and changes in interpretations of certain soil properties.

Samples for chemical and physical analyses were taken from representative sites of several soils in the survey area. The chemical and physical analyses were made by the Soil Survey Laboratory (SSL), Natural Resources Conservation Service, Lincoln, Nebraska, and the Department of Plant and Soils Science, University of Tennessee-Knoxville (USDA 1996). The SSL analyses are available in computerized data files, which can be accessed on the National Soil Survey Center Web site at http://www.nssc.nrcs.usda.gov. The

University of Tennessee analyses are included in a thesis by M.C. Oliver (Oliver 1997).

After completion of the soil mapping on 7.5-minute topographic maps, map unit delineations were transferred by hand to orthophotographs at a scale of 1:24,000. The density of the soil map units was generally decreased as a result of the change in map scale from 1:15,840 to 1:24,000. Surface drainage and cultural features were transferred from 7.5-minute topographic maps.

# Reference 8

**Athens Furniture Industries, Inc.**

Leak/Spill Report
January 6, 1998

CFO File #54-10


# ATHENS® FURNITURE INDUSTRIES, INC.

P.O. Box 929 • Athens, Tennessee 37371-0929 • (615) 745-1833


January 6, 1998

RECEIVED
JAN - 7 1998
Chattanooga Field Office

Tenn. Dept. of Environment and Conservation
Solid/Hazardous Waste Division
540 McCallie Avenue
Chattanooga, TN 37402-2013

Attention: Ms. Lynne Koby

Re: Report of Leak/Spill

We wish to report a leak/spill of approximately 1000 gallons of furniture finishing sealer material which occurred during the plant holiday period and was not discovered until startup on January 5, 1998.

The leak was in an underground transfer pipe near a concrete tile which allowed the material to flow into an open concrete ditch (approx. 210' long) running between two buildings. The sealer is a high solid/low HAPS material containing over 22% solids (mostly nitrocellulose and sanding agents) with the balance being a mixture of various solvents including a small amount of VHAPS.

We believe the volatile materials evaporated during the slow flow in the ditch before the material entered an open dirt drainage area leading away from the building alongside a railroad track.

Immediately upon discovery of the leak, the pipes were turned off and cleanup operations commenced. After consulting with three technical representatives of our finishing material supplier, it was decided to simply pick up the remaining residue. The white solidified residue was shoveled up and placed into 55 gallon drums for proper disposal.

Since this is the same "special waste" that is generated from our spray booth cleaning operations, we plan to burn it in our wood fuel boilers. Our boiler air pollution permit allows this material to be burned as supplementary fuel.

The vast majority of the residue was picked up before dark on Monday, January 5, 1998, the day of discovery. The balance of the cleanup operation should be completed by the end of business Friday, January 9, 1998. All remaining material in the leaking pipe will be gravity drained into a drum for future use in the finishing operation.

If you require further information, please contact Joe Lawson at (423)745-2441, Ext. 113.

The site address of the leak is:

1241 Frye Street (P. O. Box 929)

Athens, TN 37303

Respectfully,

Joe Lawson

Joe Lawson
Environmental Mgr.

## Reference 9

**Tennessee Department of Environment and Conservation**
**Division of Geology**

Bulletin 61
Nashville, Tennessee 1959, reprinted 1993

Division of Superfund

STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF GEOLOGY

BULLETIN 61

# GEOLOGY, MINERAL RESOURCES, AND GROUND WATER OF THE CLEVELAND AREA, TENNESSEE

BY

GEORGE D. SWINGLE

Prepared in cooperation with the U.S. Geological Survey

NASHVILLE, TENNESSEE

1959

REPRINTED 1993

layers. Glauc[illegible]urs at several horizons, and thin beds of richly glauconitic sandstone have been observed. Much of the sandstone is silty, and in places lenses of sandy shale are present. Weathered sandstone blocks are heavily iron stained and are typically colored reddish brown.

Siltstone beds constitute a large portion of this unit. These occur in thick beds or as laminae associated with shaly zones. The colors of individual beds differ, but brown, red, and green are most common. Thin beds of green clay shale are present locally, but these constitute a very minor portion of the unit.

Lack of continuous exposures prevents accurate measurement of the thickness of this member. Close folding and minor faulting, observable in most outcrops, suggest that duplication of beds is common. The maximum thickness of this member in the Cleveland area is believed to be about 300 feet. Variations in the width of outcrop belts and apparent changes in lithology suggest that the unit is slightly thicker in the western part of the area, but the apparent thickening may be due to structural duplication of beds.

The resistance of the sandstone beds to weathering, and the usually steep dip of the unit, give rise to distinctive topography. The low ridges produced by weathering generally reflect accurately the changes in structural trends. The upper and lower boundaries of the member are normally marked by abrupt breaks in topography. Soils overlying the member are shallow and acidic and contain abundant fragments of shale, siltstone, and sandstone. Natural exposures are poor, even along the steep ridges, and the presence of this member is indicated solely by sandstone float and topographic expression.

## Conasauga Group

The term Conasauga was used by Hayes (1891, p. 143) and Walcott (1891, p. 304) to designate argillaceous shales containing numerous lenses and thin beds of limestone in Whitfield and Murray Counties, Ga., near the Conasauga River. Smith (1890) called approximately equivalent rocks the Coosa and Flatwoods shales, and Safford (1856) called them Knox shales. Northward from the type area, limestone units in rocks of equivalent age become more persistent and the formations shown below are recognized.



**Formations of the Conasauga group in northern East Tennessee**

| *Name* | *Type locality* | *Age* |
|---|---|---|
| Maynardville limestone | Maynardville, Union County | Late Cambrian |
| Nolichucky shale | Nolichucky River, Greene County | |
| Maryville limestone | Maryville, Blount County | Middle Cambrian |
| Rogersville shale | Rogersville, Hawkins County | |
| Rutledge limestone | Rutledge, Grainger County | |
| Pumpkin Valley shale | Pumpkin Valley, Hawkins County | |

Rodgers and Kent (1948, p. 7-8) cite faunal and lithologic evidence from areas to the north for extending the original lower boundary of the Conasauga downward in the section to include a shale sequence (the Rome shale of older reports) ordinarily included in the Rome formation of earlier workers. To avoid confusion in terminology Rodgers and Kent assigned the name Pumpkin Valley shale to those lower beds. The upper boundary of the original Conasauga has been shifted higher in the section (Rodgers and Kent, 1948, p. 11-12) to include the Maynardville limestone named by Oder (1934), who considered it the lowest unit of the Knox dolomite as used by him.

In this report the Conasauga group includes all units between the Rome formation (Rome sandstone of Hayes and Keith) and the top of the Maynardville limestone. This group in the Cleveland area has features intermediate, in part, between the well-defined shale-limestone sequence to the north and the argillaceous beds to the south. The youngest formation of the group, the Maynardville limestone, has insofar as determinable, rather similar features throughout the area. Older units change in character from the southeasternmost belt (the strike belt of the type locality) across belts to the northwest. Variations in lithologic facies of the Conasauga group are shown diagramatically on figure 2.

Faunal evidence indicates that the Pumpkin Valley shale (Rodgers and Kent, 1948) and the Rutledge, Rogersville, and Maryville formations (Resser, 1938) are of Middle Cambrian age. The Nolichucky and Maynardville formations are of Late Cambrian age (Resser, 1938; Oder, 1934). In the Cleveland area the Middle-Upper Cambrian boundary is apparently not everywhere marked by a prominent lithologic break such as exists in areas to the north. Dolomite beds believed to be approximately of early Nolichucky age are present in some belts, and the base of these beds is believed to mark the approximate Middle-Upper Cambrian boundary.

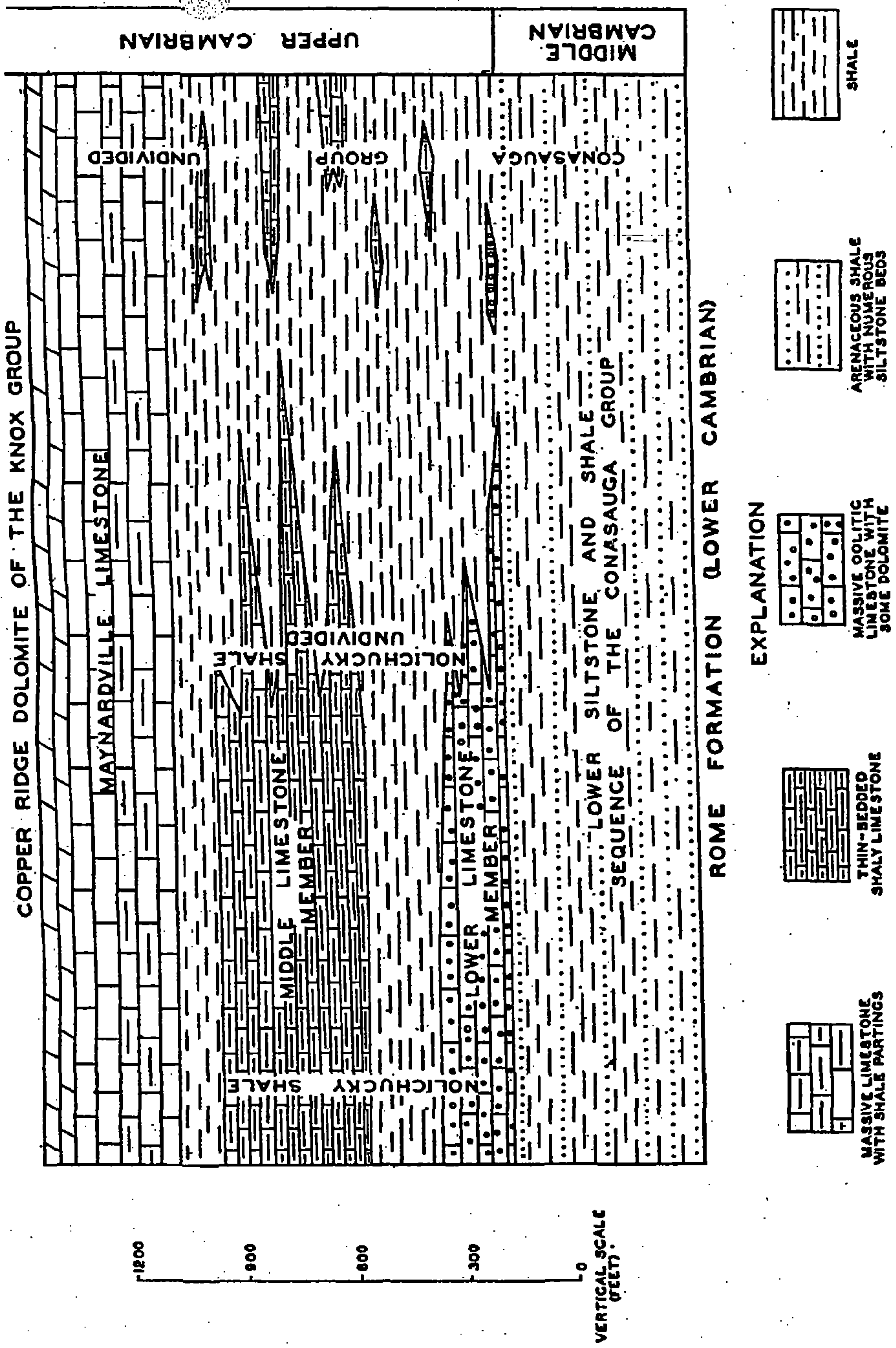



FIGURE 2.—Lithologic facies of the Conasauga group in the Cleveland area, showing the named subdivisions used on the geologic maps (pls. 1-4).



## BELT SOUTHEAST OF THE KNOXVILLE FAULT

Rocks of the Conasauga in this belt are divisible into two mappable units, (1) a lower shale and limestone sequence designated the lower siltstone and shale sequence and the Nolichucky shale, undifferentiated, of the Conasauga group and (2) the overlying Maynardville limestone. It is possible that the rocks below the Maynardville could be subdivided into a lower siltstone unit equivalent to the lower siltstone and shale sequence of the Conasauga in the belts to the northwest and an upper limestone and shale unit equivalent to the Nolichucky shale. Widespread faulting, intricate folding, the absence of distinctive marker horizons, and poorness of outcrop, however, would make such a subdivision a formidable task.

### LOWER SILTSTONE AND SHALE SEQUENCE OF THE CONASAUGA GROUP AND NOLICHUCKY SHALE, UNDIFFERENTIATED

Exposures of the lower silty rocks of the Conasauga are numerous in the belt that lies east of the Pumpkin Center and Chatata Valley synclines. These rocks were originally mapped by Hayes as Rome. The slightly higher topography east of the Chestuee fault marks the approximate position of the silty beds.

Alternating beds of siltstone, 1 to 4 inches thick, and sandy shales typify the lower silty beds of the Conasauga. These beds are remarkably uniform in appearance over wide areas, being easily recognized by their drab-olive-green, brown, and slightly reddish colors. Clay shales are present, but these constitute a minor portion of the lower silty sequence. Some thin beds or lenses of dark-colored limestone and dolomite are present. In local areas these beds are oolitic or conglomeratic. Secondary veinlets of white calcite commonly are present along fractures.

The thinly bedded siltstones and shales grade upward into clay shales, and nodules, lenses, and thin beds of blue argillaceous limestone. Pastel shades of pink and green, and a decrease in silt, characterize these upper beds. The limestone lenses are much lighter in color than those lower in the Conasauga and are also more persistent along the strike. In the upper beds of the Conasauga just below the Maynardville limestone, the light-green and yellow clay shales are remarkably free from siltstone beds.

Structural conditions and scarcity of exposures make it impossible to determine the thickness of the lower siltstone and shale sequence and the Nolichucky shale, undifferentiated, in this belt. It is estimated, however, that the thickness of the unit is less than 1,000 feet. Outcrop widths suggest that the lower silty beds are thicker than the overlying shales and limestones.

Limestone beds in the upper part of the Conasauga below the Maynardville are believed to be more common than exposures indicate. Weathering removes the soluble carbonate minerals from the argillaceous limestone, and the shaly material remains in the soil. The soil thus produced, together with creep from nearby weathered shale beds, resembles the residual materials normally produced by weathering of calcareous shale. In the absence of outcrops it is difficult to trace the limestone beds through the residuum. A marked topographic break, however, generally occurs at the contact between the lower silty beds and the overlying shales and limestones. Resistance of the numerous siltstone beds to erosion produces a characteristic low, knobby topography. The more calcareous upper beds underlie shallow, rolling valleys.

### Maynardville limestone

The Maynardville limestone (Oder, 1934) is excluded from the Knox group because of its lithologic similarity to the other limestones in the Conasauga group, and because of the absence of chert, chert being characteristic of the overlying Knox. The lower boundary is placed at the base of the lowest massive limestone bed in the upper part of the Conasauga group. Thin shaly zones may be present above the lower limestone, but these do not exceed 1 to 6 feet in thickness. The upper boundary is drawn at the base of the lowermost massive dolomite bed of the overlying, locally asphaltic, dolomite sequence. The upper boundary in the residuum is marked by the presence of abundant chert which weathers from the Copper Ridge dolomite; in some areas it is marked by a tripoli zone consisting of several beds as much as 6 inches thick.

The Maynardville is a massive blue argillaceous limestone in the lower part and thinly bedded light-gray dolomite in the uppermost portion. In weathered exposures the lower limestone has a ribboned appearance produced by abundant shaly partings. Fine-grained to coarsely crystalline limestone is present, grading upward into dolomitic beds. Light-tan crystalline dolomite laminae alternate with light- to dark-gray silty limestone laminae in the uppermost portion of the formation. The term "straticulate" has been used to describe this laminated limestone and dolomite. Above the straticulate beds, gray silty dolomite is present in beds 1 to 3 feet thick.

In the southeasternmost belt (in Polk County) the upper dolomite beds are apparently replaced by blue limestone. In that area, however, exposures are so scarce that little is known of the Maynardville or of the overlying Copper Ridge.

Northwest of the Polk County belt the Maynardville is about 350 feet thick. The upper dolomite portion appears to be 50 to 75 feet thick and the underlying limestone, 275 to 300 feet.



Rocks of the Maynardville weather readily and outcrops are uncommon. In many areas exposures are limited to one or two per mile, and in some areas they are even less abundant. Where outcrops are lacking, a generally chert-free orange-red soil indicates the position of the formation. Steeply dipping beds give rise in many areas to a row of low hills that stand higher than the valleys underlain by the lower siltstone and shale sequence and the Nolichucky, undifferentiated, of the Conasauga. Slopes of these hills generally are covered with colluvial materials from the overlying Knox, and the precise position of the Maynardville is difficult to ascertain.

## BELT BETWEEN THE KNOXVILLE AND SALTVILLE FAULTS

The Conasauga group in this belt is composed of three mappable units, (1) a lower siltstone and shale sequence, (2) overlying clay shales and limestones, and (3) the Maynardville limestone. The limestones and shales overlying the silty beds are believed to be approximately equivalent to the Nolichucky shale and are designated Nolichucky (Ꞓn), although the lower beds may not be entirely correlative with the Nolichucky in its type locality.

North of Cleveland, in Walker Valley, all three of these units of the Conasauga are present. Exposures are poor, and the section is pieced together from scattered outcrops.

### Lower siltstone and shale sequence of the Conasauga group

The contact between the lower siltstone and shale sequence of the Conasauga and the underlying Rome formation is easily established along the east side of Mouse Creek Ridge north of Cleveland. Although bedrock exposures are infrequent, the contact is located by the pronounced topographic break between the high knobs underlain by sandstones of the Rome and the lower hills underlain by siltstone and shale. The upper boundary of the lower silty sequence is also indicated topographically by the transition from the low hills, underlain by silty beds, to the gentle valleys formed on the shale and limestone beds. Near Anstis Lake, 3 miles north of Cleveland, outcrops of coarsely oolitic limestone suggest that limestone beds occur in the upper part of the lower siltstone and shale sequence of the Conasauga; however, outcrops of similar limestone were not observed along the strike.

The lower silty beds of the Conasauga in this belt consist of thinly bedded siltstones and sandy shales that are quite similar to beds at the same stratigraphic position in the area southeast of the Knoxville fault. In this belt the coloration of the beds is somewhat more pronounced. In addition to the drab-brown and olive-green beds to the southeast, red and purple layers are quite common.

As in other areas, the exact thickness of the lower siltstone and shale sequence of the Conasauga is impossible to determine. It is believed, however, that the unit does not exceed 600 feet in thickness.

### Nolichucky shale

Locally, the rocks between the lower silty beds of the Conasauga group and the Maynardville limestone may be subdivided into shale and limestone units. One such area is southeast of Anstis Lake. From scattered outcrops in this area the following sequence of beds appears to be present: (1) A lower zone of oolitic and massive blue limestone overlying the lower siltstone and shale sequence of the Conasauga. The thickness of this limestone is unknown but is estimated to be about 50 feet. (2) Greenish clay shale with a few thin beds of siltstone. The thickness of this unit is not known. (3) Massive to thinly bedded blue argillaceous limestone, of unknown thickness, which resembles the Maynardville limestone. (4) Greenish-yellow clay shale extending upward to the base of the Maynardville. The thickness of this shale is about 100 feet. In contrast to those in the belt southeast of the Knoxville fault, the limestone beds in this belt are more massive and probably are more continuous. The pattern of outcrops in Blue Springs Valley suggests that a continuous limestone zone is present near the middle of the Nolichucky shale.

### Maynardville limestone

The Maynardville in the belt between the Knoxville and Saltville faults is quite similar lithologically to the Maynardville southeast of the Knoxville fault. Exposures are very poor in the belt east of Blue Springs Valley south of Cleveland. North of Cleveland in the same belt, outcrops are somewhat more abundant. The thickness of the formation in this belt appears to be about 400 feet.

## BELTS NORTHWEST OF THE SALTVILLE FAULT

The Conasauga group is subdivided in the northwest belts into the following units: (1) the lower siltstone and shale sequence of the Conasauga group (Єcl), (2) a lower limestone member at the base of the Nolichucky shale (Єnl), (3) an overlying clay shale, the lower shale member of the Nolichucky, which is included in rocks designated as Єn, (4) a limestone unit, the middle limestone member of the Nolichucky, which appears to occur near the middle of the Nolichucky (Єnm), (5) an upper shale member at the top of the Nolichucky (Єn), and (6) the Maynardville limestone (Єmn). Although each of the above units may be recognized and mapped in local areas, scarcity of exposures prevent their differentiation in most places. Units 3 and 4 are mapped separately



only in the fault block northwest of Cleveland on the east side of the Beaver Valley fault and elsewhere are included in Єn. Unit 2, although probably more persistent than is indicated on the geologic maps, is mapped only along certain strike belts.

Fossils from the rocks of the Conasauga in this area indicate that the sequence including the beds from the base of the lower limestone member of the Nolichucky (Єnl) up to the top of the Conasauga group is of Late Cambrian age. Allison R. Palmer, U. S. Geological Survey, has identified the fossils discussed below.

*Llanoaspis* occurs in the beds mapped as the middle limestone member (Єnm) of the Nolichucky. This fossil was collected a quarter of a mile north of U. S. Highway 11 and 64 along Candies Creek west of Cleveland. About 1 mile north of this highway, along the eastern bank of Candies Creek, specimens of *Norwoodella, Kormagnostus, Ankoura,* and *Armonia* were collected. These forms occur in beds mapped as the Nolichucky shale. However, the coarse oolitic dolomite in which the fossils occur is evidently the lower limestone member of the Nolichucky shale (Єnl). This unit has probably been brought up along a small thrust fault, but because of the lack of exposures the fault is not mapped. Approximately 2½ miles southwest of the above locality, near Johnson School, specimens of *Acmarachis, Holcacephalus, Norwoodella, Norwoodia, Millardia, Kormagnostus, Ithycephalus, Kingstonia, Syspacheilus,* and *Tricrepicephalus* were collected. The rocks in which these fossils occur are mapped as the lower limestone member of the Nolichucky shale (Єnl).

The latter two collections indicate that the beds in which the fossils occur are equivalent in age to the lower part of the Nolichucky shale. For this reason the Middle-Upper Cambrian boundary is tentatively placed between the rocks mapped as lower siltstone and shale sequence of the Conasauga group (Єcl), and the lower limestone member of the Nolichucky shale (Єnl).

### Lower siltstone and shale sequence of the Conasauga group

In the northwestern belts this unit is characterized by more numerous and thicker siltstone beds and by richer and darker colors than the equivalent rocks in belts to the southeast. Sandstone beds as thick as 4 inches occur in the lower portion of the unit, and a few siltstone beds as thick as 6 inches are present. The brown and drab colors so typical of this unit to the southeast are replaced in part by dull purple, maroon, and reddish colors in this area, giving the unit a generally darker color. The upper boundary is placed at the base of massive coarsely oolitic limestones and dolomitic limestones. Where the limestones are absent or not exp[illegible] the contact is placed where the silty beds grade upward into clay shales containing only a small percentage of siltstone.

Topographic expression is commonly the basis for determining the location of the lower silty beds of the Conasauga. The unit gives rise to low hills, which are higher than those developed on the overlying units, but which are less conspicuous than the ridges of the Rome.

The lower siltstone and shale seems to be slightly thicker here than in the belts to the southeast; however, accurate determination of its thickness is impossible because of structural conditions.

### Lower limestone member of the Nolichucky shale

Exposures of this limestone are present in each belt between the Saltville and Whiteoak Mountain faults. The lower boundary of the limestone is placed at the top of the underlying siltstone and shale sequence. Although siltstone beds locally occur above this limestone, they are in general less abundant and less massive. The top of this unit is not so clearly defined. It is probable that the upper boundary is gradational, there being scattered beds or lenses of limestone in the overlying shale. For this reason, the top of the unit is indicated on the geologic map as gradational.

The presence of coarsely oolitic and often conglomeratic beds of limestone and dolomitic limestone typify this unit. Brown oolites 2 millimeters and larger in diameter are ordinarily present in each exposure. Tabular lenses of dolomite a few inches long are common in many beds. The limestone is generally argillaceous and ranges in texture from dense to coarsely crystalline. Blue-gray and tan colors are most common.

Outcrops of this lower limestone are plentiful in some areas. Elsewhere, only a few outcrops per mile are present. For this reason the unit, although probably present, is not mapped in several areas. In the broad valley west of Candies Creek Ridge it is not possible to trace the unit because of limited exposures. Widely scattered outcrops suggest that the unit is present, but the beds are complexly folded and faulted in that valley.

The thickness of the lower limestone member is estimated to be about 200 feet, but locally it may be much thinner.

### Lower shale member of the Nolichucky shale

Shale beds which overlie the lower limestone member of the Nolichucky shale are well exposed in the area northwest of Cleveland and east of the Beaver Valley fault. In this area the base of the lower shale member is concealed by faulting, and the upper boundary is marked by



beds of the overlying middle limestone member of the Nolichucky shale. Elsewhere northwest of the Saltville fault scattered exposures of this unit are present, but lack of outcrop prevents their being mapped as a separate unit.

Thin beds of blue argillaceous limestone less than 10 feet thick occur in this interval. These beds are lithologically quite similar to other limestones of the Nolichucky. The shale is predominantly a clay shale, commonly light brown and green but in places pink. Scattered beds, generally less than 1 inch thick, of brown siltstone occur. Lithologically, this shale is similar to the shales underlying the Maynardville limestone.

Like that of other incompetent formations in this area, the thickness of this unit cannot be determined.

### Middle limestone member of the Nolichucky shale

In several areas, such as west of the Lee Highway where it crosses Candies Creek Ridge and east of the Beaver Valley fault northwest of Cleveland, thick beds of massive blue limestone occur in the Conasauga. These beds are underlain by the lower shale member of the Nolichucky shale, discussed above, and are overlain by the shale beds that occur below the Maynardville limestone. Only in the area east of the Beaver Valley fault has this limestone sequence been mapped as a unit, and here the top of the limestone is concealed by faulting. Outcrops of similar limestone at the same stratigraphic horizon in other belts indicate that the limestones at this horizon are continuous. Lack of sufficient exposures, however, prevents their being mapped separately from the rest of the Nolichucky.

This limestone is lithologically similar to the lower portion of the Maynardville. Blue massive beds ribboned with argillaceous partings are common. Along the strike the limestone may become coarsely oolitic, resembling the lower limestone member of the Nolichucky shale, discussed above. Beds of massive gray crystalline dolomite also occur in the middle limestone member. The exact stratigraphic position of the dolomite is unknown, but it appears to occur sporadically in the lower portion of the unit. Approximately 400 feet of limestone is exposed in a quarry located in the belt east of the Beaver Valley fault and a short distance northeast of Shiloh Church. The thickness of the limestone is probably about 500 feet.

Leaching of carbonate minerals from the limestone by weathering processes leaves a residual soil which contains numerous shale fragments. These fragments are derived from the shaly partings in the limestone, and their presence makes identification of this unit difficult in deeply weathered areas.

### U[illegible] SHALE MEMBER OF THE NOLICHUCKY SHALE

The shales between the middle limestone member of the Nolichucky shale and the Maynardville limestone are quite similar to other shales of the Nolichucky discussed above. Much of the shale is composed of clay minerals and a minimum of grit. Drab-green shale predominates, although numerous thin beds of pastel-colored shale are present. Fragments of agnostid trilobites are locally abundant in this unit. The thickness of this member is unknown.

### MAYNARDVILLE LIMESTONE

Belts of the Maynardville are present along the western slopes of Lead Mine Ridge and along Candies Creek Ridge. Partial exposures suggest that the formation is quite similar to that in belts to the southeast. Along each of the above-mentioned ridges the formation is obscured by great quantities of chert derived from the Knox group. At the northern end of Lead Mine Ridge numerous outcrops of limestone slightly west of the ridge suggest that the formation may be somewhat thicker there than in other belts. However, unknown structural conditions at this locality may account for the apparently greater thickness. Although the Maynardville has not been identified along the western slopes of Pine Hill Ridge, a portion of the formation may be present.

## Knox Group

Formations of the Knox group underlie extensive areas near Cleveland; nevertheless, bedrock exposures are exceedingly rare, and little is known of the lithology of these rocks in their unaltered condition. Differentiation of the Knox group is based entirely on the characteristics of its residuum. For this reason, the residuum is discussed in detail in a later section.

A marked change occurs in the Knox from the northwestern belts to those in the southeast. The quantity of siliceous materials in the thick residuum that overlies the bedrock decreases to the southeast, and the dolomite of the northwestern belts gives way, in part, to limestone.

Faunal evidence (Butts, 1926; Oder, 1934; Resser, 1938; Rodgers and Kent, 1948) indicates that the Knox group is of Late Cambrian and Early Ordovician age.

Safford (1869, p. 204) proposed the name Knox group for exposures near Knoxville, Knox County, Tenn. The Knox shale of Safford corresponds to the Conasauga shale of later reports, and the Knox sandstone is now called the Rome formation. Hayes, Keith, Smith, Ulrich, and Butts in later mapping restricted the usage of Knox to the dolomite



sequence. In this report the Knox group includes units b[illegible] the top of the Maynardville limestone and the prominent disconformity between the Lower and Middle Ordovician rocks.

Ulrich (1911) was the first to subdivide the dolomite sequence. Oder (1934), Rodgers (1943), Oder and Miller (1945), Bridge (1945), Dunlap (1945), Rodgers and Kent (1948), Rodgers (1953), and others have refined the early subdivisions proposed by Ulrich. The widely used present classification, which is followed in this report, is shown below.

**Present classification of the Knox group**

| *Name* | *Map symbol* | *Original description* |
|---|---|---|
| Mascot dolomite | Oma | Oder and Miller, 1945 |
| Kingsport formation | Ok | Oder and Miller, 1945 |
| Longview dolomite | Olv | Butts, 1926 |
| Chepultepec dolomite | Oc | Ulrich, 1911 |
| Copper Ridge dolomite | Ꞓcr | Ulrich, 1911 |

### COPPER RIDGE DOLOMITE

Descriptions by Ulrich (1911), Hall and Amick (1934), Rodgers and Kent (1948), and others indicate that the Copper Ridge dolomite consists typically of massive dark crystalline dolomite which is commonly asphaltic. Other types of dolomite also are present, the most abundant being light gray and well bedded. Thin dolomitic sandstones occur at various horizons in the formation, particularly in the upper third.

Bedrock exposures of the Copper Ridge in the Cleveland area suggest that descriptions of these rocks in areas to the north are generally applicable here. The lower and upper boundaries of the formation as described in this report probably correspond to those described in other areas. The base of the Copper Ridge is placed at the top of the light-colored chert-free Maynardville limestone. Massive sandstones at the base of the overlying Chepultepec dolomite, which mark the Cambrian-Ordovician boundary, determine the top of the Copper Ridge. The formation is generally about 1,000 feet thick in the Cleveland area.

In the southeasternmost outcrop belt of the Knox in Polk County, light-blue limestones replace the asphaltic dolomite beds present in belts to the northwest. Limited exposures in this belt indicate that the basal 50 feet or more of the formation is limestone. These beds may be equivalent to the Conococheague limestone (Stose, 1908, p. 701) of other areas.

Fossils other than Cryptozoa have not been found. Resser (1938, p. 18) reports that several types of Cryptozoa are present in the formation, including *Cryptozoon proliferum* and *C. undulatum*. Silicified remains of these species are locally abundant in the residuum of the Copper Ridge.

Upon weathering the Copper Ridge produces large quantities of chert. These chert masses tend to retard erosion of underlying materials, and in areas of moderate dip the Copper Ridge commonly forms a low, even-crested ridge or a row of hills which stand above the surrounding terrain. Where the beds dip gently two ridges are usually produced.

## CHEPULTEPEC DOLOMITE

In northern East Tennessee the Chepultepec consists chiefly of fine- to medium-grained dolomite which is typically light gray or tan. Other types of dolomite also are present but are generally less abundant than the light-colored varieties. Much of the dolomite is silty. In the Cleveland area outcrops of the Chepultepec are virtually nonexistent. The base of the formation is clearly marked in many localities by thin sandstone beds. Angular fragments and blocks of these sandstones are commonly present in the residuum. The blocks may be 6 feet or more thick, although beds 1 to 2 feet thick are most common. In some areas thin sandy zones occur throughout the lower third of the formation; however, the more massive sands are restricted to the lower 50 feet of the unit. In bedrock exposures, the top of the Chepultepec is placed at a rather minor change in lithology (Rodgers and Kent, 1948, p. 22). In the Cleveland area the boundary is determined by changes in chert characteristics. It is believed that these changes occur within a short stratigraphic range and that they correspond approximately to the upper boundary of the formation as determined by others. The thickness of the Chepultepec is probably about 700 feet in this area.

The quantity of chert in the soils overlying the Chepultepec is less than that in the soils overlying the Copper Ridge dolomite. The formation generally underlies a broad, shallow valley downdip from the rather prominent ridges of the Copper Ridge dolomite. Low, circular depressions and marshlands are common where the lower portion of the formation underlies the residuum.

The generally unfossiliferous beds of the Chepultepec were originally designated as Cambrian or Ordovician, later as Upper Cambrian, and finally as Lower Ordovician.

## LONGVIEW DOLOMITE

Approximately the lower half of the Longview is dolomite not unlike that of the underlying Chepultepec. In the upper portion the dolomite is interbedded with blue and tan compact argillaceous limestone. In the Cleveland area the Longview is estimated to be 300 feet or less thick. The upper boundary of the Longview has been determined in areas to the north largely on faunal evidence. Rodgers and Kent (1948, p. 25) suggest that the contact between the Longview and the overlying Kingsport formation be placed between limestone containing *Lecanospira* and overlying beds which contain *Orospira*. In the Cleveland area a change in residual cherts at approximately the stratigraphic horizon mentioned above has been used to determine the Longview-Kingsport contact. A corresponding topographic change is common at this same horizon. Upon weathering, the Longview is seen to be exceedingly cherty, and the great quantities of massive chert residual from the formation give rise to a low ridge or a series of low hills. Only a very few outcrops of this formation are known in the Cleveland area.



## KINGSPORT FORMATION

The Kingsport consists typically of a lower unit of blue and tan fine-grained limestone which is usually about 50 feet thick, and an upper unit of light-colored fine-grained dolomite. In the Cleveland area the formation is approximately 225 feet thick. Exposures in this area are very poor, but a few scattered outcrops of limestone have been noted. The upper boundary of the formation is drawn at the base of a thin sandstone zone which appears to be present throughout the area. Six or seven beds of sandstone, usually less than 6 inches thick, occur at this horizon. Some of the sandstone beds are cemented with white and greenish chert to which the term chert-matrix sandstone has been applied. This horizon has been widely recognized and used to separate the Kingsport from the overlying Mascot dolomite throughout much of East Tennessee.

Much less chert is produced from weathering of the Kingsport than from the other formations of the Knox. The formation usually underlies gentle slopes or shallow valleys downdip from ridges or hills developed on the Longview. An orange-red soil is normally developed over the formation.

## MASCOT DOLOMITE

Light- to dark-gray fine-grained dolomite characteristically makes up the lower portion of the Mascot dolomite. In general the dolomite becomes lighter in color higher in the unit, and the uppermost portion of the formation contains much blue limestone interbedded with fine-grained light-gray and tan dolomite. In contrast to other formations of the Knox in the Cleveland area, outcrops of the uppermost portion of the Mascot are locally abundant. Along the Chatata Creek valley northeast of Cleveland, outcrops are rather common. In that area, beds of fine-grained blue-gray limestone as thick as 6 feet are interbedded with fine-grained to dense light-gray dolomite. Much of the dolomite is faintly mottled red or green. The top of the formation generally is

## DESCRIPTION OF STRUCTURAL FEATURES

The names of the principal folds and faults as used in the following paragraphs conform with those suggested by Rodgers (1953). Local structures which are not persistent along the strike are assigned local geographic names.

### Folds southeast of the Knoxville fault

The trace of the Knoxville fault, which lies just east of Cleveland, roughly separates the area into two structural units. Southeast of the fault relatively open folds and minor faulting prevail, whereas northwest of the fault the rocks are closely folded and strongly faulted.

*Chatata Valley syncline.*—The most conspicuous of the folds southeast of the Knoxville fault is the Chatata Valley syncline. This structure is the southwestern extremity of the Athens syncline, named for the town of Athens, McMinn County, Tenn., 15 miles north of the Cleveland area. The Athens syncline clearly extends from Cleveland some 70 miles north to about the latitude of Knoxville, Tenn. The position of the Chatata Valley structure is plainly marked in the northeastern part of the Cleveland area, where the competent beds of the Maynardville limestone and the formations of the Knox group are exposed. To the south, in the broad expanse of the crumpled Conasauga rocks, the fold is ill defined, and it evidently dies out just north of the Georgia-Tennessee boundary. The youngest formation exposed in the syncline is the Athens shale. A few hundred yards east of the Cleveland area, however, rocks of the still younger Holston formation are present. The eastern limb of the syncline is characterized by steeply dipping beds which in places are slightly overturned to the northwest. The western limb of the fold dips gently 15 to 30 degrees to the southeast. For the most part the fold is unbroken by faulting.

*Pumpkin Center syncline.*—A short distance east of the Athens syncline another synclinal structure, herein designated the Pumpkin Center syncline, is present. According to Munyan (1951, geologic map) this structure continues southwestward into Georgia for several miles. Unlike the Athens syncline, this fold is complicated by faulting, especially in the southern part of the area. A reversal of the general southwestward plunge of the structure is suggested in the southern part of the area. The eastern limb of the syncline dips slightly more steeply than the western limb through the length of the fold.

Minor folds and complex local structures are numerous in the broad shale belts which border the Athens and Pumpkin Valley folds. Most shale outcrops exhibit intricate folds and faults which have not been mapped in detail.



### Folds northwest of the Knoxville fault

The structurally competent Knox group in this area occurs principally in steeply dipping homoclinal structures. The southeastern limbs of these fold remnants are rarely present, or at least they are not exposed at the surface. Instead, these structures are bounded on the southeast by thrust faults which place older formations in contact with the formations of the Knox. The Pine Hill Ridge, Lebanon-Candies Creek Ridge, Lead Mine Ridge, and Blue Spring Ridge are examples of this type of structure. In the latter ridge near the southern boundary of the area, the steep southeastern limb of the Blue Springs syncline is present.

An exception to the homoclinal structures is the Whiteoak Mountain syncline, a shallow, broad syncline in which the northwest limb dips very gently. The southeast limb is complexly folded and faulted and is characterized by beds ranging from steeply dipping to overturned. This syncline extends for several tens of miles beyond the Cleveland area. Its southeastern limb is characterized throughout its length by complex folding and faulting (Rodgers, 1953).

The rocks of the Conasauga group and the Rome formation, which occupy large areas northwest of the Knoxville fault, are nearly everywhere complexly deformed. Isoclinal folding accompanied by strong faulting is common in the area between the Lebanon-Candies Creek Ridge and Whiteoak Mountain. Open folds either anticlinal or synclinal are numerous, but these can be traced only short distances before they give way to other structures. In nearly all places the folds in this area are broken by faults. Many of the smaller faults are not shown on the accompanying maps. One of the most continuous structures in this area of strongly folded rocks is the anticlinal structure northwest of the Lebanon-Candies Creek Ridge. This fold extends from the southwestern corner of the Cleveland area northeastward to the latitude of Cleveland. The northwest limb is sharply overturned throughout its length. Numerous drag folds are associated with the anticline.

### Major faults and related features

Most striking of the structural features are the major thrust faults. Six of the principal thrusts of the Valley and Ridge province trend northeastward across the area. Each of these faults continues for many miles along the strike (Rodgers, 1953). Five of the faults extend southward into Georgia (Munyan, 1951; Butts and Gildersleeve, 1948).

*Chestuee fault.*—The Chestuee fault, named by Rodgers (1953) for Chestuee Creek, McMinn County, Tenn., is the southeasternmost major fault in the Cleveland area. In the Chestuee Creek area, the Conasauga is thrust over the Knox group (Rodgers, 1953). Southwestward from the Chestuee Creek area the fault apparently swings out into the wide outcrop belt of the Conasauga, where relationships are less clear. Along the eastern boundary of the Cleveland area the fault also occurs in the Conasauga belt, east of the Athens syncline. Because of the generally crumpled nature of the Conasauga and sparseness of its outcrops, the fault zone is difficult to trace. Steeply dipping beds of the Knox, which compose a portion of the eastern limb of the Athens syncline, are in normal sequence and are unbroken. East of the outcrop belt of the Maynardville limestone, clay shales of the Conasauga dip to the west in conformity with the formations of the Knox. A few hundred yards to the east, however, the Conasauga is extremely crumpled. The fault has been drawn through this zone. Along this zone the clay shale and thin limestone sequence typical of the upper part of the Conasauga below the Maynardville in this area is flanked by a sequence of shale containing much siltstone and little or no limestone. The shale-siltstone series is typical of the lower portion of the Conasauga group in this area. Although the lower shale-siltstone unit could be explained as a normal stratigraphic sequence dipping northwest, it is probable that displacement occurs along the strongly crumpled zone. A short distance to the southwest along strike, the fault apparently dies out, or at least has not been recognized.

*Chatata Creek klippe.*—Although the precise location of the Chestuee fault is questionable, the best evidence for its existence is the klippe a short distance east of Chatata Creek, which is presumably related to the fault. Approximately two-thirds of the klippe is present in the Cleveland area. Reconnaissance traverses to the east indicate that this structure is entirely cut off from the fault to the east.

The rocks of the klippe include all the formations of the Knox group and a portion of the Lenoir limestone. Evidence from a few outcrops suggests that the Knox is overturned to the northwest. The overturned beds rest on the Mascot dolomite, Lenoir limestone, and Athens shale. Essentially the same relationships appear to continue throughout the length of the structure to the northeast beyond the area of this report. During the development of the klippe, a steeply dipping transverse fault striking north offset the formations of the Knox in the upper block. No evidence of this fault is present in the overridden block.

Unfortunately, bedrock exposures in the vicinity of the klippe are sparse. The formations associated with the structure have been identified and mapped largely on the characteristics of the overlying residuum. Very little is known about the attitudes of the rocks in the klippe. It is suggested that the klippe originated from a sharply overturned anticline. Willis (1934, p. 230) describes "strut thrusts" produced experimentally by Cadell in 1888, which might explain the mechanics of the Chestuee fault. The displacement along such a break theoretically would



be of limited extent. The pattern of the outcrop suggests that the actual displacement is approximately half a mile. Shortening of the shales of the Conasauga underlying the overturned anticline is accomplished by close folding and numerous bedding shears. The formations in the overriding block seem to be similar to those in the overridden block. A few miles to the east the beds of the Knox are unlike those in the klippe. Another explanation might be that the beds in the klippe are not simply the displaced western limb of the Athens syncline, but represent formations of the Knox, originally lying farther to the east, which have been shoved westward along a low-angle thrust.

*Knoxville fault.*—The Knoxville fault is more clearly defined than the Chestuee fault. The Conasauga group has been thrust against the Ottosee shale in the southern part of the area. Northeastward the Conasauga is in contact with progressively older formations until in the northern part of the area the Conasauga is in contact with the Copper Ridge dolomite. From the latitude of Cleveland northeastward several minor faults are present which appear to be branches of the main fault. Exposures of the Copper Ridge dolomite in small areas along the fault are interpreted as slices. Outcrops are virtually nonexistent in these areas and the structural relationships can only be inferred. The secondary faults trending northeastward toward the eastern limb of the Athens syncline may be directly connected with the principal fault, but these faults are difficult to trace with certainty through the crumpled shale of the Conasauga. Slightly southwest of Cleveland the main fault is interpreted as splitting into two distinct faults which continue separately throughout the area to the northeast. The validity of this assumption, especially to the north, is questionable. The belt of Knox west of the fault may be synclinal and thus a westernmost fault would not have to be postulated. If the Knox retains a southeast dip, however, the interpretation is valid. Unfortunately, no outcrops of dolomite are present in this Knox belt from Cleveland to the northern extremity of the area, and consequently the attitude of the dolomite is unknown. Exposures, although uncommon, strongly suggest that along the Knoxville fault zone from Cleveland northward many subsidiary faults in addition to the ones indicated are present.

*Red Hills klippen.*—Along the southern portion of the Knoxville fault several klippen are irregularly distributed in the Red Hills area. These structures are recognized from abundant residual chert from the Knox group. Very few outcrops are present in the klippe blocks, and distinctive cherts are absent; consequently they have been mapped as Knox group, undivided. Judging from the gross characteristics of the residual cherts in these areas, however, the Knox is apparently very similar to that northwest of the Knoxville fault. It is unlike the Knox in issue [illegible]g faults. About a quarter of a mile south of Flint Spring another spring of this type occurs. Here the water moves downdip along the Holston formation until it is forced to the surface along the contact with the overlying Ottosee shale.

#### Springs in topographic lows

Springs in the Cleveland area are controlled principally by topography and the position of the water table. They occur at the junction of the water table and land surface, and are present along all stream valleys and in many areas not occupied by permanent streams. They occur in rocks of all types, but the larger ones invariably are associated with the carbonate formations. Richey Spring (37-S), east of Cleveland and adjacent to Chatata Creek, is one of the largest in the Cleveland area. In this locality the Mascot dolomite dips 10 to 20 degrees to the southeast near the axis of the Athens syncline. In shale, siltstone, and sandstone areas springs are ordinarily small and of the seepage type.

## Relation of Ground Water to Structure

The rock structure in the Cleveland area influences the ground-water resources, first, in controlling the position and distribution of the important aquifers, and second, in controlling the movement of ground water within those formations.

In the Cleveland area most of the ground water occurs in secondary openings in the rocks, principally joints, faults, and associated fractures. Near the surface all the rocks are cut by joints and crevices, but these fractures do not persist to great depths. In many places the joints are sealed with minerals that are relatively impermeable. In spite of this, however, the joints have a strong influence upon the occurrence and movement of ground water. Weathering processes are facilitated by movement of water along the joints and bedding planes, in both the clastic and the carbonate rocks. The depth to which water is able to descend more or less freely in crevices is generally as much as 300 feet in the limestone formations and about 75 feet in the shale, siltstone, and sandstone formations. In a few places, weathering undoubtedly extends to greater depths.

As a general rule, it is impossible because of the poorness of outcrops to predict from surface observations the location and abundance of joints. The position of faults and fault zones can, however, be determined in most cases from surface observations. Owing to the linearity of these fractures, their positions can be predicted even in areas where outcrops of bedrock are sparse. For this reason faults are of considerable practical importance in the location of ground-water supplies. Fractures



along fault zones extend to greater depths than joints, and hence they make possible the development of ground water at greater depths. In most places, however, it is not likely that water can be obtained from depths greater than 300 feet, even along faults.

The many folds of diverse types and trends in the Cleveland area are of little practical importance in the prediction of ground-water supplies except as they control the distribution of the important aquifers. Locally, if fold patterns are known, areas of fractured rocks can be predicted in a general way. As a rule, however, outcrops of the carbonate formations are not abundant enough to determine accurately the location of fractured zones related to folds.

## Relation of Ground Water to Topography

In the Cleveland area the configuration of the water table resembles that of the land surface, but the water table is at greater depths beneath hills, as a rule, than beneath valleys. Fluctuations of the water table are similarly greater in hill and ridge areas than in low-lying areas. In periods of drought, wells on ridges are more likely to become dry than those at lower elevation, because of the larger seasonal fluctuations.

In some places, particularly along ridges underlain by dolomite of the Knox group, ground water is perched or semiperched in the residuum—that is, it is prevented by the low permeability of the residuum from "seeking its level" as readily as does water in the more permeable bedrock. Under such conditions the depth to the water table may not be greater than in adjacent valleys, and the magnitude of water-table fluctuation may be slight. An example exists in East Cleveland. The depth to water in well 152 is generally about 30 feet (pl. 6). Well 36 (pl. 6) is approximately 300 feet from well 152 and at about the same elevation, yet the depth to water in well 36 is consistently 100 feet more than in well 152. Excessive pumping from the shallow well (152) would soon deplete the water in storage near the crest of the ridge. However, the deeper well would continue to yield water for a much longer period. The shallow well is a well dug in cherty residuum of the Knox group, whereas the deep well penetrates bedrock.

## Aquifer Properties

The quantity of water that water-bearing rocks will yield by either natural or artificial discharge depends in part upon the hydrologic characteristics of the rocks. The permeability, which is a measure of the ability of a rock unit to transmit water, and the specific yield, a measure of the quantity of water that will drain from a rock formation, are sig-

# Reference 12

## Email Correspondence

Athens Utility Board, McMinn County Tennessee
Angela Young DSF personnel

February 12, 2003
March 6, 2003
March 24, 2003

**Angela Young - RE: Athens Furniture Industries**

**From:** "Jill Davis" <jdavis@aub.org>
**To:** "'Angela Young'" <Angela.Young@state.tn.us>
**Date:** 02/12/2003 4:33 PM
**Subject:** RE: Athens Furniture Industries

Hey Angela,
I believe this is one I can help you on. The storm water from this site does follow the rail road tracks and then enters the City of Athens storm water system, opens up in a few areas for short distances and ultimately discharges into Oostanaula Creek near the intersection of N. Jackson Street and Green St. right across from the Athens Post Office. I hope this helps,
Jill Davis

-----Original Message-----
**From:** Angela Young [mailto:Angela.Young@state.tn.us]
**Sent:** Wednesday, February 12, 2003 11:50 AM
**To:** jdavis@aub.org
**Subject:** Athens Furniture Industries

Hello Jill,
I am conducting a PA for this facility located at 1241 Frye Street. We visited the perimeter of the site to determine the surface water pathway and concluded that the site discharged into Dry Creek via a ditch that runs parallel with the Southern Railroad line. Water Pollution Control has a file on Athens Furn that includes an NPDES permit stating that the receiving water is Oostanaula Creek. Does AUB have any information that confirms either of the two. I am trying to figure this out without another road trip to this site. Athens Furniture NPDES permit expired in 2001.
Any info you or your staff might know would be greatly appreciated.
Thanks
Angela
TDSF

**Angela Young - RE: Athens Furniture, 1241 Frye Street**

**From:** "Jill Davis" <jdavis@aub.org>
**To:** "'Angela Young'" <Angela.Young@state.tn.us>
**Date:** 03/06/2003 9:14 AM
**Subject:** RE: Athens Furniture, 1241 Frye Street

Hey, sorry it took me a few days to get to this. The site is in the city so most folks you would assume are on AUB water. If you travel on Hwy 39 away from town, you will find some wells. We guessed this is outside of your 1 mile radius but would be within the 4 mile radius. If you travel from the site on Rocky Mount Rd. toward Hwy 11 (intersection at the High school) across the street you are approximately ½ mile from the site and from the Jiffy (or some gas station) and apartments there, several of those houses in that direction would be using well water. The nearest industrial well from the site is at PI (Plastic Industries) across Hwy 11 from Lowes and Staples. I know these are vague answers but they will at least get you started in the right direction. We do not keep up with folks we do not serve so I don't have a data base to pull from. One other mentionable landmark to your site is a RCRA 'dirty closure' landfill from Thomas and Betts. The site has still not been NFRAP'ed from EPA if things haven't changed since I was there. The site faces Rocky Mount Rd. and is a large field (as is should be) between a cemetery and SealTech (part of PI).
Hope things are going well for you guys.
Jill

> -----Original Message-----
> **From:** Angela Young [mailto:Angela.Young@state.tn.us]
> **Sent:** Wednesday, March 05, 2003 9:55 AM
> **To:** jdavis@aub.org
> **Subject:** Athens Furniture, 1241 Frye Street
>
> Hi Jill,
> Is there a location within one mile of this site that is not served by AUB. We are trying to determine the nearest well to the site.
> Thanks
> Angela

**From:** "Jill Davis" <jdavis@aub.org>
**To:** "Angela Young" <Angela.Young@state.tn.us>
**Date:** 3/24/03 9:50AM
**Subject:** RE: Oostanaula Creek

We measured the flow (October 2001) in several different locations d/s of our plant and the average was about 12.0 cfs. I hope this helps.
Jill

-----Original Message-----
From: Angela Young [mailto:Angela.Young@state.tn.us]
Sent: Monday, March 24, 2003 9:45 AM
To: Jill Davis
Subject: Oostanaula Creek

Could I get a flow rate on this creek from AUB.
Thanks for all your help I am almost finished with this PA.
Angela

# Reference 13

**Department of Environment and Conservation**
**Division of Water Pollution Control**

Notice of Intent
Multi-Sector General Permit

2002 Proposed 303 (D) List
Pages 1, 58-59 and 178

Original

DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER POLLUTION CONTROL

# Notice of Intent (NOI)

DEC 11 1997

for Storm Water Discharges Associated with Industrial Activity under the

# Tennessee Multi-Sector General Permit

## I. Facility Operator

| | |
|---|---|
| Legal name: ATHENS FURNITURE IND. INC | Status of operator: 01. ☐ Federal 02. ☐ State 03. ☐ City 04. ☐ County 05. ☑ Private |
| Mailing address: P O BOX 929 | |
| City: ATHENS TN 37371-0929 | State: TN Zip: 37303 Phone: 423 (745) 2441 x 113 |
| Contact person: JOE LAWSON | Title or position: SAFETY/ENVIRO MGR. |

## II. Facility Identification

| | |
|---|---|
| Facility name: ATHENS FURNITURE (BED & DM PLANTS) | Mailing address: PO BOX 929 ATHENS TN 37371-0929 |
| Street address: 1241 FRYE ST | Contact person: JOE LAWSON |
| City: ATHENS (McMINN) | State: TN Zip: 37303 Phone: 423 (745) 2441 x 113 |

## III. Receiving Water and Site Location Information

Storm water from facility enters following stream(s): Give names. OOSTANAULA CREEK

If storm water enters above stream via a municipal storm sewer system, give name of municipality: CITY OF ATHENS TN.

| | |
|---|---|
| Enter location of facility (center): | Area of facility property: App 27 ☑ acres ☐ sq. feet |
| Latitude: 35 deg. 26 min. 31 sec. | Area of impervious surfaces: App 330,000 ☐ acres ☑ sq. feet |
| Longitude: 84 deg. 33 min. 46 sec. | Attach an 8.5"x11" U.S.G.S. topographical map, a city map, or a county map, identifying the location of this facility. ATTACHED |

## IV. Industrial Information

SIC codes: List primary as no. 1.

1. 2511 2. ______ 3. ______ 4. ______

Nature of business: MFG. of WOOD HOUSEHOLD FURNITURE

Activities at facility: Check all that apply.

| | |
|---|---|
| 01. ☑ Manufacturing | 02. ☐ Storage/Distribution |
| 03. ☐ Vehicle storage | 04. ☐ Trucking Terminal. |
| 05. ☑ Vehicle maintenance | 06. ☐ Hazardous waste TSD |
| 07. ☐ Outside waste disposal | 08. ☐ Recycling |
| 09. ☐ Wastewater treatment | 10. ☐ Land application |
| 11. ☐ Landfill | 12. ☐ Mining operations |
| 13. ☐ Coal pile | 99. ☐ Other ______ |

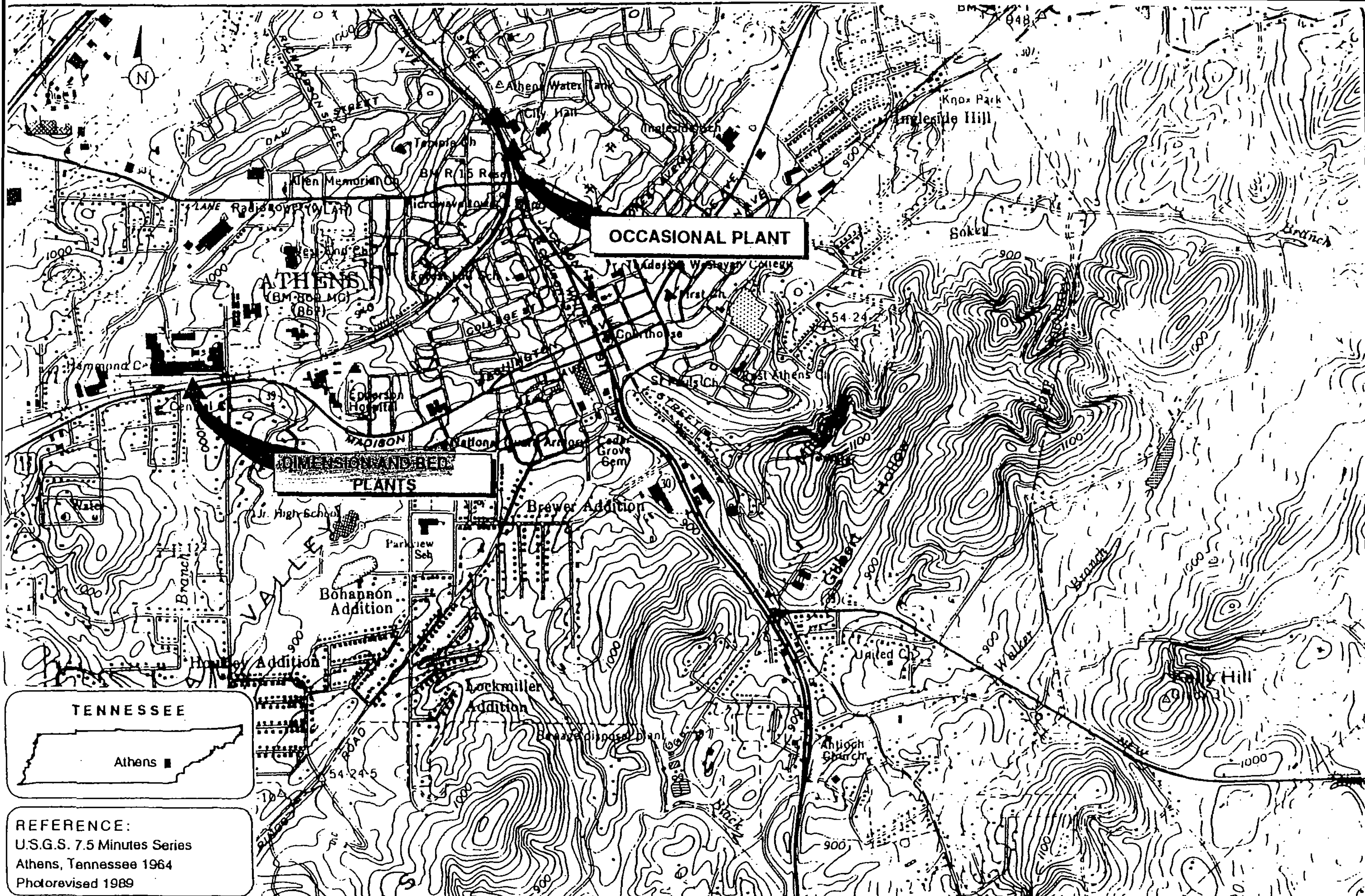
## Department Use Only

| | | |
|---|---|---|
| Date NOI Received: RECEIVED APR 25 1997 | NPDES TMSP No: TNR05 3541 | Field Office: CFO |
| | Postmark: 04-24-97 | Reviewer: SAL |

CN-1108

(continued on reverse)

RDAs 2399 and 2400




0 2,000 ft

**Regional Location Map**

Athens Furniture Company Athens, Tennessee

FIGURE

**1**

# STATE OF TENNESSEE

# NPDES PERMIT

## No. TNR053541

General NPDES Permit for

# STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

Effective March 1, 1997, through December 31, 2001

Tennessee Department of Environment and Conservation
Division of Water Pollution Control
401 Church Street
6th Floor, L&C Annex
Nashville, Tennessee 37243-1534

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.):

Discharger: ATHENS FURNITURE IND., INC. (ATHENS)

is authorized to discharge: storm water associated with industrial activity

from a facility located: AT 1241 FRYE STREET IN MCMINN COUNTY

to receiving waters named: OOSTANAULA CREEK

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

Coverage under this general permit shall become effective on April 29, 97 and shall expire on December 31, 2001.

Notice of Coverage Issuance date: December 08, 97

Paul E. Davis

Paul E. Davis, Director
Division of Water Pollution Control

Enclosed Industry Sectors: W P

CN-0759

RDAs 2352 and 2366

# ATHENS® FURNITURE INDUSTRIES, INC.

P.O. Box 929 • Athens, Tennessee 37371-0929 • (615) 745-1833


NOV 25 1997

PLS 11/25
TPW 12/1
CMA 12/5
TVH
GDR
JFR
CLR
File: Athens Furniture Co
1997 McMinn

November 24, 1997

Tennessee Department of Environment & Conservation
Division of Water Pollution Control (TMSP)
540 McCallie Ave, STE 550
Chattanooga, TN 37402-2013

In accordance to the TMSP Requirement that the appropriate field office (Chattanooga) be notified when the SWPPP is completed, Athens Furniture Industries, Inc., hereby advises you that our plan has been completed as of November 24, 1997.

Very Truly Yours,

Joe Lawson
Environmental Manager

Hold
No NOI
NOC

# PROPOSED FINAL VERSION

# YEAR 2002
# 303(d) LIST

September, 2002

**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

**Division of Water Pollution Control**
**Planning and Standards Section**
**6th Floor, L & C Annex**
**401 Church Street**
**Nashville, Tennessee 37243-1534**

# GUIDANCE FOR UNDERSTANDING AND INTERPRETING THE PROPOSED FINAL 303(d) LIST

**September, 2002**

***What Is the 303(d) List and Why Is It Important?***

The 303(d) List is a compilation of the streams and lakes in Tennessee that are "water quality limited" or are expected to exceed water quality standards in the next two years and need additional pollution controls. Water quality limited streams are those that have one or more properties that violate water quality standards. They are considered to be impacted by pollution and not fully meeting designated uses.

Additionally, the 303(d) List prioritizes impacted streams for specialized stucies ca ec ¯ota Vaximum Dai y Load (TMDL).

The 2002 303(d) List will update and replace the previous one published in 1998. (EPA suspended the requirement to publish a List in the year 2000 due to ongoing attempts to revise the 303(d) regulation.)

Once a stream has been placed on the 303(d) List, it is considered a priority for water quality improvement efforts. These efforts include traditional regulatory approaches such as permit issuance, but also include efforts to control pollution sources that have historically been exempted from regulations, such as certain agricultural and forestry activities.

If a stream is on the 303(d) List, the Division cannot allow additional loadings of the same pollutant(s). In extreme cases, it may mean that dischargers will not be allowed to expand or locate on 303(d) Listed streams until the sources of pollution have been controlled.

***Which Tennessee Streams Are Not On the 303(d) List?***

Streams considered unpolluted, plus streams that the Division cannot assess due to a lack of water quality information, are not found on the List. Additionally, streams where a control strategy is already in the process of being implemented are not appropriate for listing. (The condition placed on the control strategy is that the requirements must be expected to result in the attainment of the water quality standard before the next 303(d) listing cycle.)

Thus, any stream not on the 303(d) List can be assumed to either be unassessec, unpo utec, or witn an effective control strategy already in place. A list of streams where TMDLs have already been generated and approved for specific pollutants is included as Appendix C.

At one time, EPA advised states to not list streams if a TMDL would be of little practical benefit, such as when pollution has been caused by **historical** rather than by current activities. A good example would be lakes with a fishing advisory due to sediment contaminated with legacy chemicals from past discharges.

In 1998, EPA reversed this position and now advises that these streams must be included on the 303(d) List and prioritized for future TMDL generation. We are aware that future revisions to the TMDL regulation may revisit this issue. For the 2002 303(d) List, the Division has listed all impacted streams as uniformly needing a TMDL without regard for the probability of future success of such an activity.

**Hiwassee River** This basin contains the following USGS Hydrologic Unit Codes: 06020002 (Hiwassee River).

| Waterbody ID | Impacted Waterbody | County | Partial | Not | CAUSE (Pollutant) | Pollutant Source | COMMENTS |
|---|---|---|---|---|---|---|---|
| TN06020002 001 - 0100 | AGENCY CREEK | Meigs | 32.7 | | Pathogens | Pasture Grazing | |
| TN06020002 005 - 0200 | UNNAMED TRIB TO CANDIES CREEK | Bradley | 6.7 | | Siltation<br>Other Habitat Alterations | Pasture Grazing | |
| TN06020002 008 – 1000 | HIWASSEE RIVER | Bradley<br>McMinn | 7.7 | | Pathogens | Agriculture | Fecal levels may be lower now, but not enough data to consider de-listing. |
| TN06020002 009 – 2000 | SOUTH MOUSE CREEK | Bradley | 6.5 | | Unknown Toxicity<br>Siltation<br>Other Habitat Alterations | Urban Runoff/Storm Sewers<br>Illicit Connections/Illegal Hookups/Dry Weather Flow<br>Channelization<br>Bank Modification/Destabilization | Upper South Mouse Creek |
| TN06020002 012 – 1000 | CHATATA CREEK | Bradley | 27.6 | | Siltation<br>Other Habitat Alterations<br>Pathogens | Pasture Grazing | |
| TN06020002 018 – 3000 & 4000 | HIWASSEE RIVER | Polk | 11.4 | | Flow Alteration | Upstream Impoundment | Provides habitat for the federally listed Cumberland bean pearly mussel (Villosa trabalis). Section between Apalachia Dam and Powerhouse impacted by flow diversions. |
| TN06020002 081 - 0100 | CANE CREEK | McMinn | 13.7 | | Pathogens | Pasture Grazing<br>Urban Runoff/Storm Sewers | |
| TN06020002 082 – 2000 | CHESTUEE CREEK | McMinn<br>Monroe | 17.9 | | Pathogens | Pasture Grazing | Upper Chestuee is impacted. |
| TN06020002 083 – 1000 | OOSTANAULA CREEK | McMinn | 5.7 | | Pathogens | Pasture Grazing | A fecal coliform TMDL has been developed for this watershed. |
| TN06020002 083 – 2000 | OOSTANAULA CREEK | McMinn | | 21.1 | Pathogens | Pasture Grazing | Water contact advisory. A fecal coliform TMDL has been developed for this watershed. |

Proposed Final 2002 **303(d) LIST (Hiwassee River Basin cont.)**

| Waterbody ID | Impacted Waterbody | County | Partial | Not | CAUSE (Pollutant) | Pollutant Source | COMMENTS |
|---|---|---|---|---|---|---|---|
| TN06020002 083 – 3000 | OOSTANAULA CREEK | McMinn | | 7.4 | Nutrients<br>Pathogens | Major Municipal Point Source<br>Urban Runoff/Storm Sewers | Water contact advisory due to bypassing & collection system problems in Athens. A fecal coliform TMDL has been developed for this watershed. |
| TN06020002 083 – 4000 | OOSTANAULA CREEK | McMinn | | 8.5 | Pathogens | Pasture Grazing | Water contact advisory. 319 Project in this section. A fecal coliform TMDL has been developed for this watershed. |
| TN06020002 083 – 5000 | OOSTANAULA CREEK | Monroe | 6.2 | | Pathogens | Pasture Grazing | A fecal coliform TMDL has been developed for this watershed. |
| TN06020002 084 - 0500 | LITTLE NORTH MOUSE CREEK | McMinn | 8.5 | | Pathogens | Pasture Grazing | |
| TN06020002 084 - 1000 | NORTH MOUSE CREEK | McMinn | 45.2 | | Pathogens | Pasture Grazing | |
| TN06020002 085 - 1000 | SPRING CREEK | McMinn | 33.8 | | Pathogens | Pasture Grazing | |
| TN06020002 087 - 1000 | ROGERS CREEK | McMinn | 21.6 | | Pathogens | Pasture Grazing | |
| TN06020002 088 - 1000 | PRICE CREEK | Meigs | 6.9 | | Pathogens | Pasture Grazing | |

## Conasauga River

This basin contains the following USGS Hydrologic Unit Codes: 03150101 (Conasauga River).

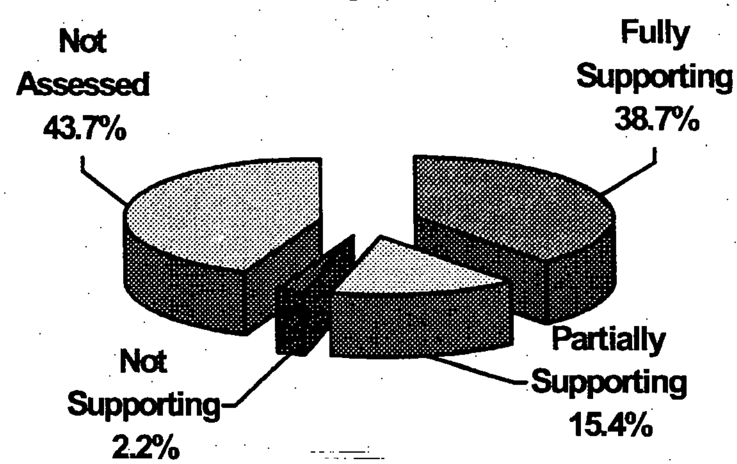
| Waterbody ID | Impacted Waterbody | County | Partial | Not | CAUSE (Pollutant) | Pollutant Source | COMMENTS |
|---|---|---|---|---|---|---|---|
| TN03150101 012 - 0200 | MILL CREEK | Bradley<br>Polk | 20.1 | | Nitrate<br>Pathogens | Pasture Grazing | |
| TN03150101 012 - 0300 | BALL PLAY CREEK | Polk | 5.0 | | Nitrate<br>Pathogens | Pasture Grazing<br>Septic Tanks | |

| Hiwassee River Watershed Atlas | | |
|---|---|---|
| HUC Code: | TN06020002 | |
| Counties: | Bradley | Meigs |
| | McMinn | Monroe |
| | Polk | |
| Ecoregions: | 66g | 66e |
| | 67f | 67g |
| | 67h | 67i |
| Drainage Size of Watershed: | | 1011 square miles |
| Stream Miles in Watershed: | | 1,657.0 |
| Stream Miles Fully Supporting: | | 640.8 |
| Stream Miles Partially Supporting: | | 255.0 |
| Stream Miles Not Supporting: | | 37.0 |
| Stream Miles Not Assessed: | | 724.2 |
| Lake Acres in Watershed: | | None |
| TDEC Monitoring Stations: | | 53 |
| Non-TDEC Monitoring Stations: | | 21 |
| Advisories: | | 1 |
| Watershed Monitoring Group: | | 2 |

## Surface Water Quality in Hiwassee River Watershed

About half of the watershed is in Tennessee with the remainder in North Carolina and Georgia. This is a predominantly rural area defined by farms, small towns, and the Cherokee National Forest. Sixty-nine percent of assessed stream miles are fully supporting. Pathogens from agricultural activities affect 88 percent of the impaired stream miles.

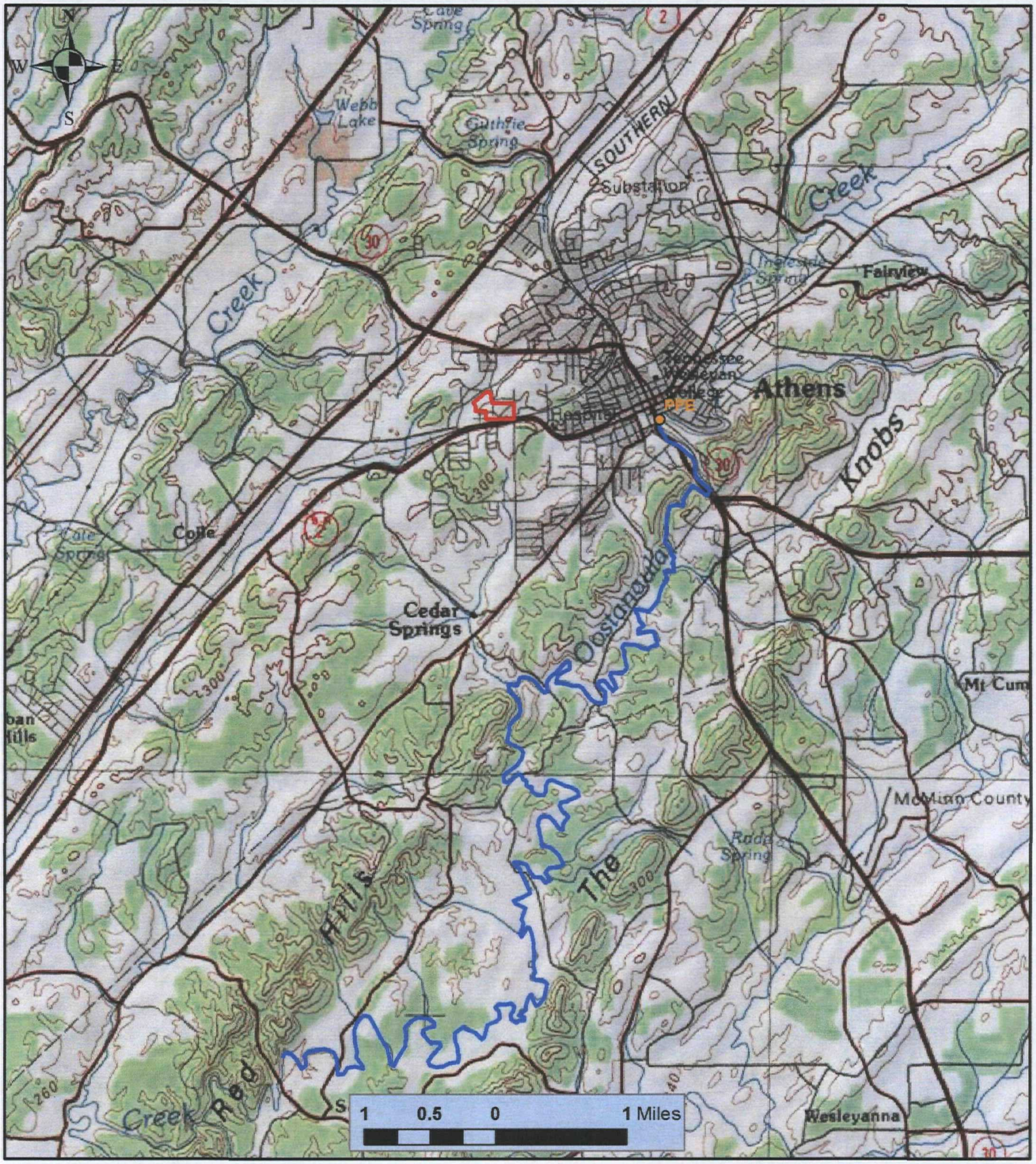
A part of the Hiwassee River is designated as a State Scenic River, and is popular for recreational boating and fishing. Four high quality streams are subecoregion reference sites, Gee Creek in 66e (Southern Sedimentary Ridges), Brymer and Harris Creeks in 67g (Southern Shale Valleys), and Blackburn Creek in 67h (Southern Sandstone Ridges).




**2002 Assessment of Rivers and Streams in Hiwassee River Watershed**

# FIGURES

# Figure 1

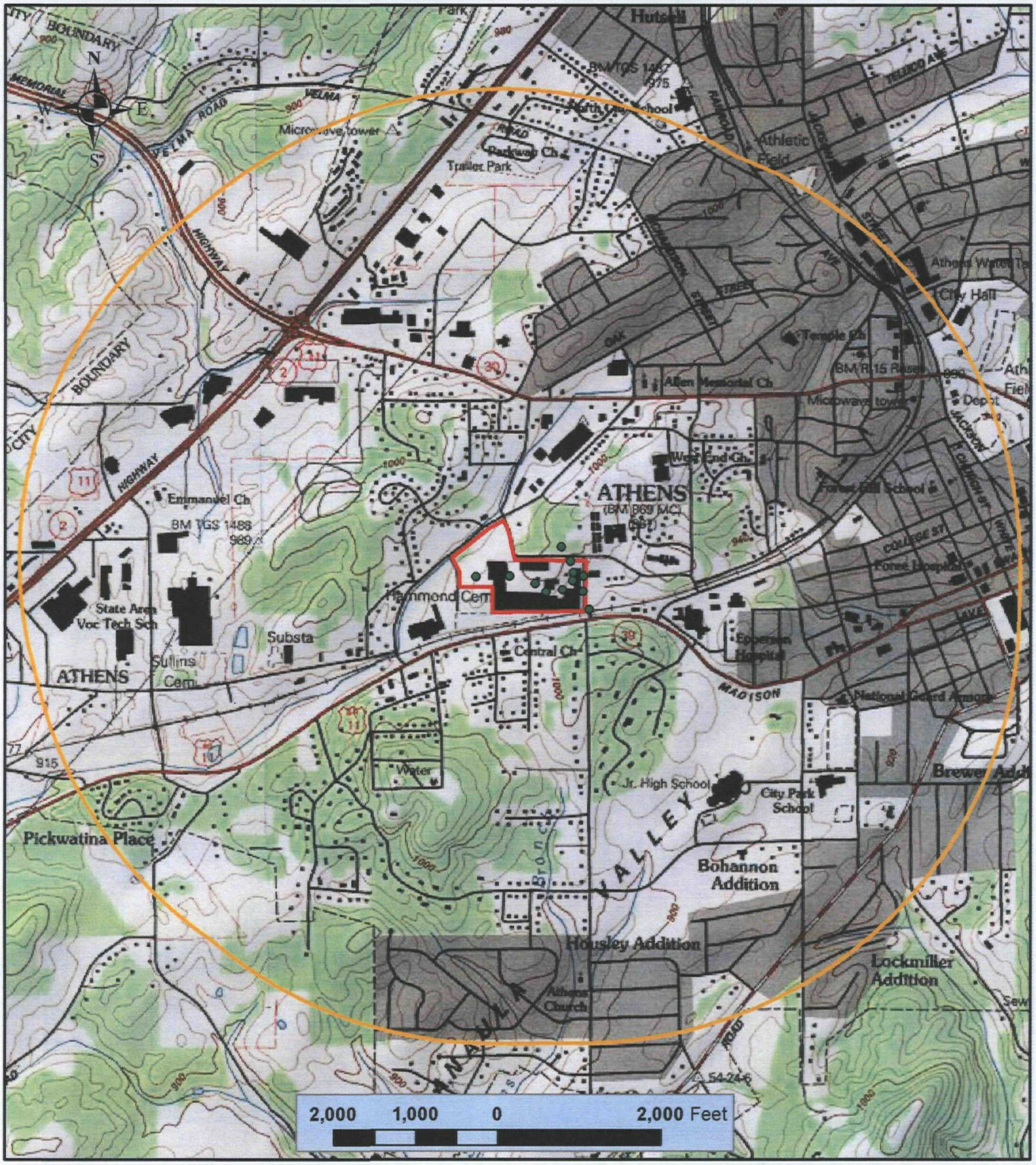



Site Boundary
15-Mile Surface Water Pathway

Athens Furniture
Regional Site Vicinity Map and
15-Mile Surface Water Pathway
EPA ID: TND000814525
TDoR Site ID: 54-519

Source: National Geographic TOPO 1:100,000

# Figure 2



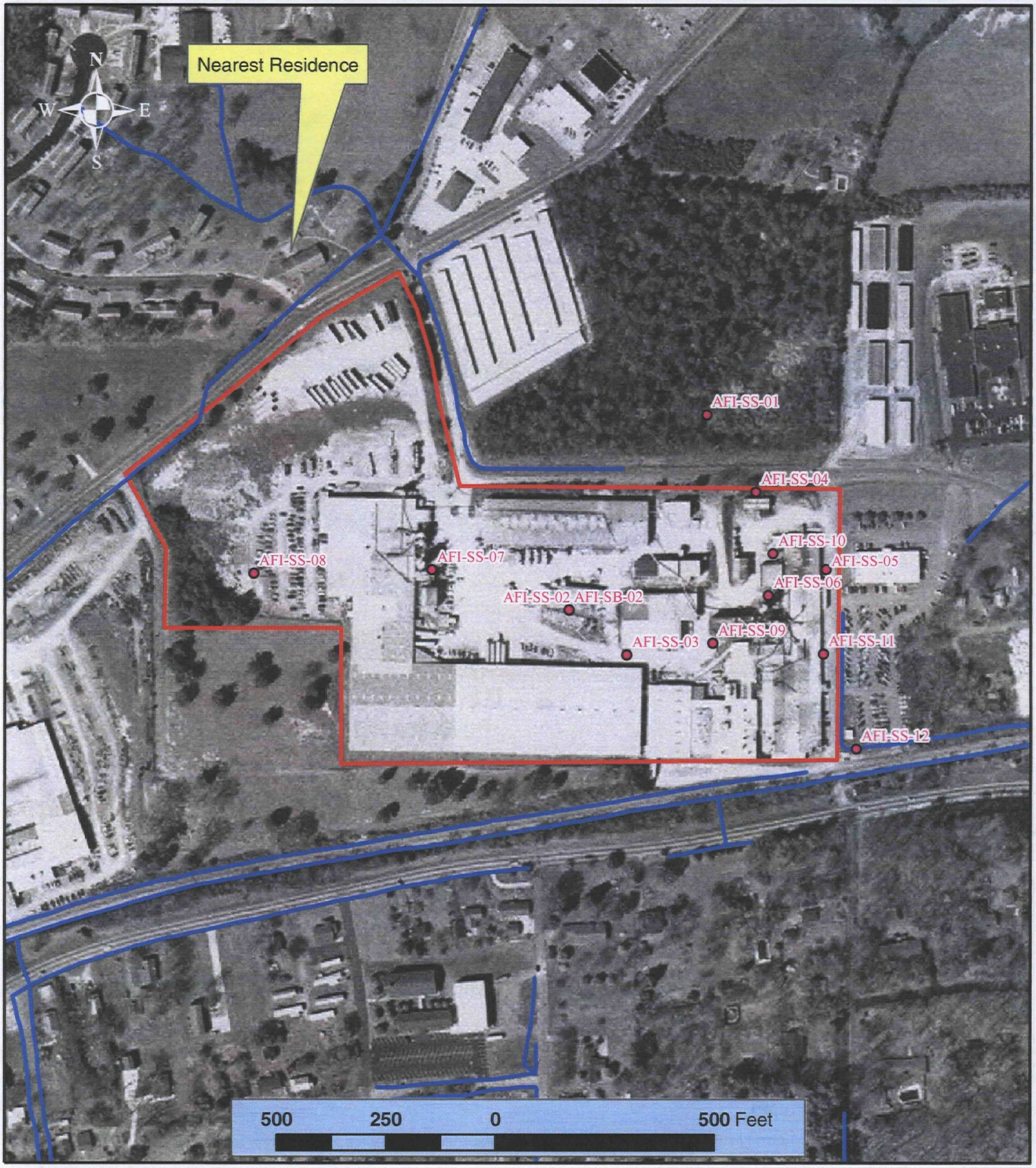

Site Boundary

1-Mile Radius

**Athens Furniture**
**Site Vicinity Map**
**EPA ID: TND000814525**
**TDoR Site ID: 54-519**

**Source: National Geographic TOPO 1:24,000**

# Figure 3




Site Boundary
Drainage and Surface Water
Proposed Sample Location

**Athens Furniture**
**Sample Location Map**
**EPA ID: TND000814525**
**TDoR Site ID: 54-519**

## Figure 3a


Site Boundary
Drainage and Surface Water
Proposed Sample Location

**Athens Furniture**
**Sample Location Map**

**EPA ID: TND000814525**
**TDoR Site ID: 54-519**